BREAK-IN

March/April 2013

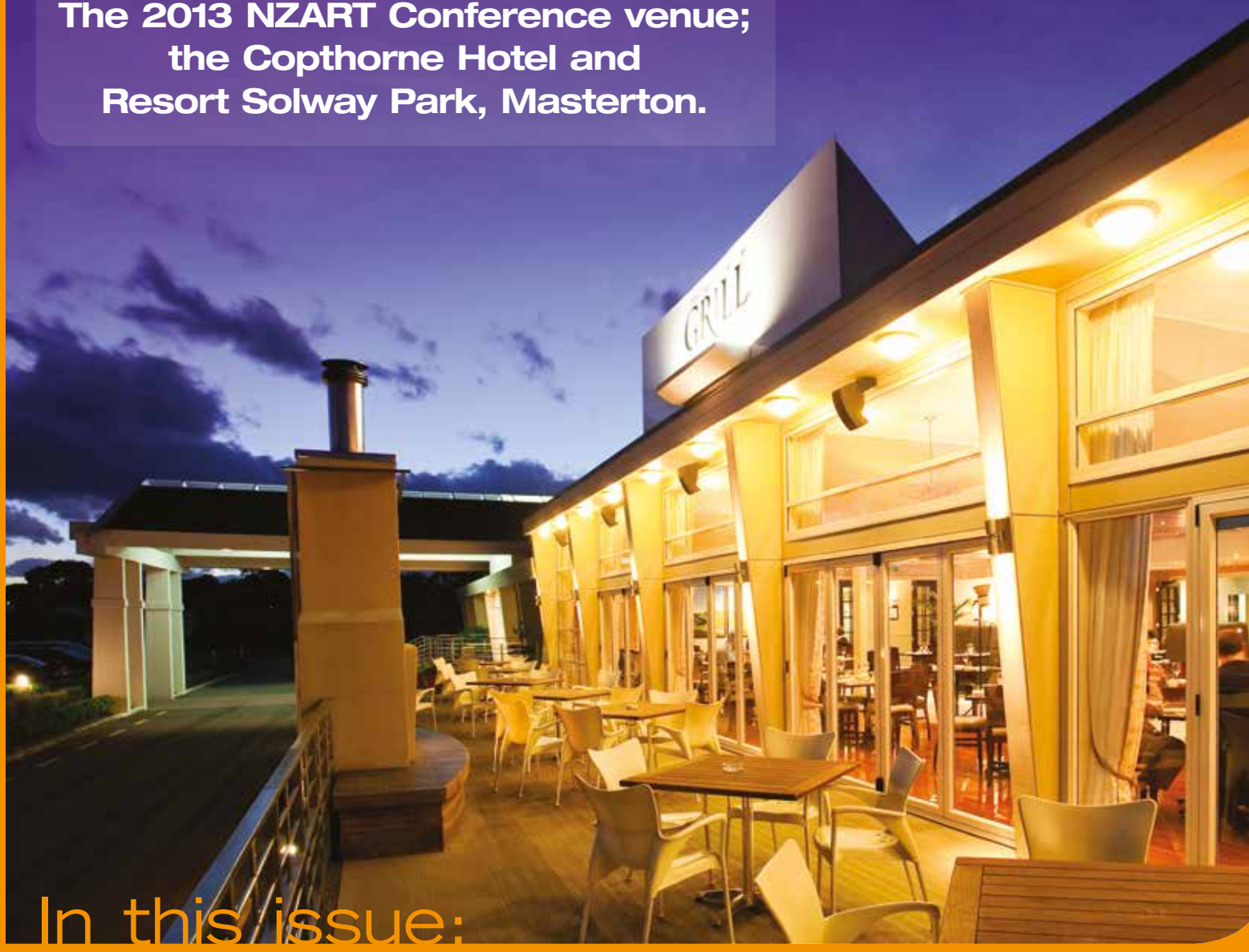
The Official Journal of the
New Zealand Association of Radio Transmitters (Inc.)

Dedicated to

Amateur Radio and Electronics

in New Zealand since 1928

The 2013 NZART Conference venue; the Copthorne Hotel and Resort Solway Park, Masterton.



In this issue:

- Building a 1.2 kW Solid State PA for 144 MHz; Part 2
- A simple Portable L-Shaped HF antenna for 20 and 17 m
- Review of 70 cm Bandplan
- Gettering/Conditioning tubes (valves)
- NZART National Conference; Agenda, Annual Reports, Remits and Registration Form
- ZL Crossword 21

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*The term **break-in** refers to a system in CW whereby the transmitting station can hear the other station's signal during "key up" periods.*

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Indexes for past volumes of *Break-In* from 1949 to the present are available on the NZART website: <http://www.nzart.org.nz/breakin/index/index.html>

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From The Editor

John Walker ZL3IB
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As usual this March/April issue of *Break-In* is bigger than normal because it has the the usual range of Annual Reports, Remits plus Conference information and Registration form. Unfortunately I am unable to attend Conference this year and will miss the valuable opportunity it offers to meet up with old and new friends.

Regretfully there is not a lot of news from the editorial desk this issue. Personally I have found it rather disappointing that there seems to be very little general activity on most HF bands; no one seems to want to indulge in a simple "rag-chew". The only time the bands seem to come alive is during contests but I have to confess that this type of 'hello/good-bye" has no appeal to me.

73, *John Walker ZL3IB, Editor*

Stop Press

We apologise for the late delivery of this issue of *Break-In* due to delays in receipt of the financial and auditor's reports.

Next deadline for copy is
10 May 2013

continued from page 2

Douglas ZL2AHB who serves as both Advertising Manager and *Call Book* Editor is resigning in order to spend some time travelling. If anyone is interested in applying for either of these positions, please let Debby ZL2DL know at Headquarters <nzart@nzart.org.nz>.

That's it for this issue of *Break-In*. My thanks to our Editor, John ZL3IB for his tolerance as my copy was just a little late arriving on his desk. I hope to see many of you in person at our Annual conference and AGM in Masterton over Queens Birthday Weekend.

Vaughan Henderson ZL1TGC,
NZART President

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From The President

Vaughan Henderson ZL1TGC
<zl1tgc@nzart.org.nz>

By the time you read this, the voting for President and Council in the Midlands Electoral District will have closed and the results will have been announced. I do hope you all voted and I await the results with interest.

On behalf of you all, I would like to extend to Arthur "Stalky" Law ZL2HE our sincere congratulations on being awarded a civil honour by the Tararua District Council. Arthur received the award in recognition for his meritorious service to the district, and in particular his home town of Dannevirke. The award recognised in particular, over 60 years of volunteer service to the blind, going out of his way to support members in the Dannevirke and wider Tararua communities. When asked why he helped out a number of organisations, amongst them the Royal New Zealand Foundation for the Blind, the Cancer Society of New Zealand and the New Zealand Association of Radio Transmitters, his response was simple: Why not? Arthur has been an active radio amateur for many years and was on NZART Council from 1976 to 1977 and again from 1979 to 1984. Congratulations Arthur on a well deserved award.

Council met in person on Saturday 16 February at Wellington Airport in one of the conference rooms. This central venue works very well for our February meeting as the central location means that Councillors from all parts of the country can get to the one-day meeting without needing to incur overnight accommodation costs. Your Council only meets twice a year in-person or face-to-face (F2F), in February and again on the Friday prior to our Queens Birthday Weekend Conference and AGM. The remaining monthly meetings held are held "on air" on 3820 kHz on the first Tuesday of each month. This does result in some matters of a confidential nature being held over until an in-person meeting. It also gives Councillors a chance to speak freely on issues they have a concern about!

After reviewing all the reports from Officers and moving to adopt them in preparation for publication in *Break-In*, Council spent some time considering a 56-page report from Neill Ellis ZL1TAJ giving the background to the recent decision to conduct a review of the current 70 cm Band Plan. Neill had done an excellent job putting together in one document, a number of emails, technical reports and some complaint letters. As the complaint letters, in particular from one individual, were released to Council on the condition that they remain confidential, I'm not able to expand further on their contents. The remaining email correspondence and discussions suggest that there is a need to review what modes of operation should be allowed on our 70 cm band, and elsewhere in this issue of Break-In is the call for submissions. A Working Group has been formed to evaluate the responses and submissions. The members of the working group are Neill Ellis ZL1TAJ, Warren Harris ZL2AJ, Phil King ZL1PK and FMTAG. The FMTAG members involved are David Andrews ZL2SX, Doug Ingham ZL2TAR and Terry Thomas ZL4TAE. To give everyone time to make submissions, the deadline is 20 April. The matter will also be discussed at Technology Convention in Auckland at Easter time. A draft recommendation will be circulated to all amateurs for any further input before becoming a final recommendation to Council.

During the F2F meeting Council had the opportunity to discuss the planned 70 cm band plan review with David Andrews ZL2SX, chairman of FMTAG and Doug Ingham ZL2TAR, FMTAG Secretary. Both indicated a willingness to assist with the review process. The other visitor to the Council F2F meeting was our Administration Liaison Officer, Don Wallace ZL2TLL. Council was pleased to note in his annual report that Don had appointed a deputy, John Yaldwin ZL4RF and endorsed this appointment. Thanks John for offering to take on this role and I'm sure you will be of assistance to Don ZL2TLL in his day to day work for us. Don gave council an update on his annual report, a copy of which is in this issue of *Break-In*. Of particular note was a plan by Radio Spectrum Management to shut down all remaining analogue Channel 39 Amateur Television Repeaters from the middle of this year. Don has been active, contacting the trustees of these ATV repeaters to determine the impact of this decision on their operation and to see what can be done to get an extension of this time for those ATV interest groups who are not yet ready for Digital Switch-Over. While on the subject of the digital Switch-Over or DSO, I note that many of you are looking forward to the final switch off of commercial analogue TV in your area which will again free up the 6m amateur band. This has already happened in parts of the country and the process will be complete by the end of this year. There is a slight complication with the return of the 50 to 51 MHz part of the 6m band to all New Zealand radio amateurs in that the license or "rights" to this spectrum do not expire until 2015. In other words, the current license holders, the various television broadcasters still have ownership rights to this frequency spectrum until the end of 2015. Don ZL2TLL advises that his discussion with the interested parties indicates that amateur use following on from DSO is not expected to be a problem. In the meantime, at least until the end of this year, if you want to operate in the band 50 to 51 MHz, you will still have to be the holder of an operating permit, issued by Radio Spectrum Management.

Your Association's financial situation received careful consideration and Council had the opportunity to discuss options with our Treasurer, Evan Sayer. Currently we have funds invested which are sufficient to sustain us for two years (operating costs) if we suddenly had no other source of income. To grow our Association, new members are essential and Council has taken on the task of contacting those who did not renew or have yet to renew their subscriptions for 2013. If you are one of those, you may get a phone call!

The other item from the Wellington in-person meeting I wanted to tell you about is an initiative from Phil ZL3PAH who lead a discussion looking at future directions for NZART. Input from several Council members identified a number of areas we need to work on such as better marketing, improving the look of our web site, and a "Train the Trainers" package for Branches who are interested in running classes. An important outcome was a decision to ask you, our members how you feel about your Association, and what you would like to see us do to improve what we are doing. We will be sending out a comprehensive questionnaire with the May/June issue of *Break-In* and will be seeking your views on the future direction of your Association.

Warren ZL2AJ has started on a possible "Train the Trainers" weekend and is seeking a central North Island venue for the first of these. Don't worry, a second such course is planned for interested members in the South Island.

The NZART web site has come in for some criticism in recent weeks. Please note this is not a criticism of our current webmaster, Alan ZL1AMW who is doing an excellent job of keeping it up to date. What we are looking for is an individual or individuals who could work up a new look for our web site, in particular the front page. Do you know anyone who could help in this area? If so, please let me know <zl1tgc@nzart.org.nz>. Maybe a complete web site re-design is what's needed or just some re-work to make the initial impression bigger, brighter and better!

I'm pleased to report that we have received some nominations for the Jumbo Godfrey Award. While nominations for Amateur of the Year and Young Amateur of the Year have closed, if you know of someone in your club who has done an outstanding job, be they old or young, it's not too late to put in a nomination, but please do so now! Nominations for the Jumbo "ZL1HV" Award close on 1 May 2013 at HQ.

As I'm sure you all know, the work of our Association is very dependent on the many hours of voluntary time put in by our Officers. However, as with any organisation, our volunteers have to resign from their position for many reasons. Two of our current Officers are seeking a change: Jim Tittsler ZL2IA who has done an excellent job as moderator of the NZART-Members email reflector wishes to stand down from this job and Lorne

continued on page 1 opposite

Building a 1.2 kW Solid State PA for 144 MHz; Part 2

by Simon Lewis ZL4PLM

Operation

To place the PA in operation you need to apply 50 V DC at 30 A to the board, apply drive to the input. With a properly terminated 50 ohm load on the amplifier output and cooling turned on, 12 V is applied to the bias point and the amplifier will 'turn on' and start operating.

You need to pay some attention to how you feed and look after your little investment and time spent designing the support electronics before you start building will mean it has a long and happy life and you do not grow grey hairs worrying about that little lump of silicon which is powering out the watts.

The amplifier itself takes 2-4 watts approx to drive to 1-1.2 kW. The IC-9100 will not run at that low a level and so I inserted an attenuator which consists of 2 x 50 ohm chip attenuators (10 dB and 3dB) that bolt down to a small aluminium heat spreader which is mounted to the internal chassis. The attenuator allows the IC-9100 to run at 40-50 W for 4 W or so at the amplifier input.

This also means a level of safety to prevent overdrive and possible damage from the high power transceiver being run at 100 W into the amplifier. You can of course alter the attenuation levels to meet whatever drive level you have available.

Test run into the dummy load – an easy kW.

Metering

Like all good amplifier builders I wanted some nice monitoring and status LEDs on the front panel as well as some metering to show me what's going on when the amplifiers in use. The amp controller board offers LED status lights for power, transmit, amp on and fault trips for SWR trip and over temperature. I added some resistors to add 28 V, 12 V and 50 V status lights simply using some appropriate resistors. The result looks professional and pleasing and is eye catching in use.

Metering is done in two ways. For RF I use a commercial bidirectional coupler (another Ebay® special) and yes, another of Jim W6PQL's boards. The little RF sense board takes the sampled RF from the coupler forward and reverse ports and rectifies this to a small DC voltage that drives the bargraph module for FWD/REF power. The coupler samples the 1KW level down by about -30 dB and the RF sense PCB components can be selected for the required amount of attenuation and whether the sense voltage out is positive or negative going .

For the 50 V DC monitoring I use a small board and design that was conceived by Ron VK4DD. This uses a DC current sensor manufactured by Honeywell. The CSNF661 is set up in this circuit to give a DC voltage out versus the current passing through the sensor. The device itself is very easy to use. Simply pass the 50 V DC lines to the amplifier through the sensor twice and then the device then reads 5 V for 50 A FSD. It's easy to drive the bargraph scales to give a 5 V FSD for 50 A ie 30 A = 3 V. A small pot allows you to calibrate the output while monitoring the DC current on a clamp meter or DC shunt. These devices are not particularly cheap; around $NZ 70 but they are easy to use and simple to design into a piece of equipment.

It is then simply a matter of drawing the front panel scales to this output. The bargraphs are another Ebay special. I found a company amazingly called 'The Bargraph Company' on Ebay® that manufactures and sells all manner of LED bargraphs in a wide range of styles and shapes. I chose some larger ones than the typical 10 segment 14 pin DIL type and, after some discussion with the company, had some customised colours set up using green, yellow and red LEDs.

They are really nice units and I can highly recommend them. I could hardly buy the parts for a simple 10 segment unit for the price of these customised beauties. I selected a 5 V input and 12 V supply line. On reflection the 5 V FSD was fine for current and voltage but to drive 5 V FSD from the RF sense PCB output I had to use a couple of op amps to set the right gain levels for the bargraphs. Not a real problem but worthwhile mentioning so you don't fall into the same trap.

Whilst on the subject of DC, Jim's clever little amplifier controller also provides an SWR trip function to protect the amplifier in the event of a fault where it is operated into no load or bad SWR. The board senses the reverse voltage from the RF sense PCB and outputs a logic low alarm if the SWR trip functions. Excessive SWR trips the amplifier and removes DC supply from the RF pallet until reset, locking out the PTT. Over temperature locks out the PTT in a similar fashion until the temperature reduces below the threshold set. Simple and easy functions that help protect your little investment.

Cabling and Switching

RF cabling and switching depend your own preferences and station build styles and what you can obtain locally. Transfer relays are nice and reduce the overall amount of cabling but they are quite hard to obtain and can be expensive.

I used some N type relays I purchased off Ebay® some time ago. These are made by Narda and are easily capable of 1 kW continuous rating at 144 MHz. I installed these on the side wall of the amplifier, which requires a few extra RF patch cables but it still looks relatively neat. The high power interlinks are constructed from RG393, which is a high power rated Teflon coax. Jim W6PQL uses LMR400 but I find it's hard to bend round small radii and so I used the more flexible 10 mm RG393. It still fits LMR400 connectors and I can still use my LMR400 connectors and crimper. You can also use a transfer switch similar to Jim's design if you desire or even a small low power BNC relay on the input and a high power version on the output – all options are possible and supported.

The antenna relays are fed from +28 V DC from the 28 V internal amplifier power supply, the minus side of the relays is controlled by one of the sequencer event switches on the amplifier control board. The output of this event also comes out on the back panel to a Cinch socket and is used to control the preamplifier relays. An additional sequencer event also controls bias to the RF pallet, PTT switching of the transceiver and the negative

Amplifier RF Deck side.

ALC voltage to hold off RF until the system has finished switching.

Sequencing of the whole station is enabled from the controller and

Completed Amplifier minus PSU (remote mounted under desk).

ensures that the whole transceiver, amplifier, preamplifier switches in a safe and controlled sequence. This ensures relays switch only while 'cold' and preamps are protected from high power RF.

Again all steps to ensuring a stress free life running high power.

The small multipurpose amplifier controller which is the heart of the support electronics is mounted on a single PCB using surface mount components. There is an ability to add a pass transistor allowing the board to be supplied from 50 or 28 V DC or alternatively you can supply the board with 13.8 V directly. I use 28 V as this is the relay voltage and the board can source a few amps at 13 V with ease using the pass transistor option which I can use on accessories such as the bargraph meters.

Housing

Once you have all the pallet and support electronics ready you will need a suitable case to house it all in. This should be solid and relatively RF proof to ensure that the amplifier does not leak RF round the shack.

Sadly despite being relatively good with the soldering iron my metalwork skills do not usually match and so after a long and arduous search for a suitable case that would not require major surgery I decided to spend some $$$ and designed/ordered a customised case from Front Panel Express®. This has actually turned out to be an excellent move and I have not had to rework the case in any way while building the amplifier up. Not only that but I simply copied the design again with minor lettering changes for the 432 MHz version too! Which saved a huge amount of work on doing the next band up!

It's not the cheapest of options but you get a very professional fully customised case from your order in just a few days. You can't really beat that can you?

You can download the CAD package for free from the Front Panel Express website and its worth spending time getting to know how to use this. The more time you put into the design the better the outcome. The software is available for Windows, Mac OS X and Linux. The package is still in development but has some great features built in. I like being able to print 1:1 paper versions and stick them to card and do some prototyping before committing to a final order. It saved my skin on a number of occasions. The package also allows you to design something and see how much it will cost. There are some good forums that can help reduce costs by carrying out processes in certain ways, so it definitely pays to spend time reading and understanding how items are manufactured by Front Panel Express.

I have now designed and ordered a number of cases using the designer package and all have been delivered quickly and the quality is superb. They are not the cheapest option but they are fully customised and come in a wide range materials, colours, finishes and thicknesses. You can also create cases using a range of extruded profiles in different sizes and colours. Lettering and graphics can be engraved and coloured. Shapes and cut outs added and even complex shapes like fan cut outs included in your design. You even make your own macros. I have one set up for N type connectors for example. There are tips on how to create engravings on the forum. You can even create curved lines and scales for panel mounted potentiometers like volume controls. Logos and scales can be imported from a variety of design sources and included in your final masterpiece.

The FPE team are also very good in offering suggestions and checking design files and in the end you end up with a superb custom-made case to a high quality finish. Perhaps expensive but the results speak for themselves. A number of friends have commented on how professional the case looks and that's what I was aiming for especially when investing a large amount of money in a single home built accessory.

My case measures 350 x 290 x 220 mm and constructed using side rails of extruded and anodised aluminium. These mount to 3mm front and rear panels. Side panels of 2 mm anodised aluminium slot into the extrusions and are joined to the front and rear panels by small threaded diecast brackets. Screws hold the whole side plates together to form a solid construction which is similar in fashion to that used by Elecraft® in their range of equipment.

A solid 3 mm base of plain anodised aluminium forms an inset internal chassis plate and these slots mesh into a milled hole in the front and rear panels to provide rigidity for the internal plate supporting the heavy heat sink. An additional case plate covers the base of the amp and means no unsightly holes can be seen. Four nice equipment feet are bolted through the bottom chassis cover to finish off the case.

The front panel has cut outs in place for vents, bargraphs and switches and is engraved and filled in a variety of colours to produce a pleasing look and feel.

The rear panel carries a fused mains connector for the internal 28 V DC supply, which is an off the shelf switch mode with a capability of 5 A which I have found fine for powering the relays and internal components.

N types are used for RF input and outputs. I use Cinch connections for PTT lines and ALC outputs.

A large cut out on the rear panel allows heat from the heat sink duct to exit the case. The 24 V fan for the internal case/balun cooling also mounts on the rear panel but sucks cooler air from the outside and passes this over the RF pallet as previously described.

A chassis mounted multi pin 45 A PowerPole™ connector connects the amplifier to a remote located 50 V DC supply. 50 V DC is very easy to generate these days due to the prolific use of this voltage in the computing and telecommunication industries. A quick browse of Ebay will provide a raft of 50 V high current supplies that will be suitable. Mine are no different and came from the same source, but are very RF quiet and have a remote enable line which means 50 V is only turned on when I switch the amplifier from bypass mode to amplify mode. I hide the 50 V supply away under the bench turning it on remotely only when in amplify mode. This means less noise and clutter on the operating bench and a smaller size amplifier case.

I am extremely pleased with the final product and it has been very worthwhile putting the time and effort into design and building it. The style and finish of the final amplifier looks almost commercial. In fact I have been asked if I am taking orders! The amp runs very well, is cool in operation and much quieter than the tube amp. It was relatively easy to construct and in terms of $ per watt is very economical. The Freescale® devices are very efficient. My own amplifier runs at 1200 W for around 29 A at 50 V making the overall efficiency around 82%. Extremely good for a solid state device versus around 55% for the tube amplifier. The Freescale® amp runs at the 1 kW for hours without stress or strain and without getting hot.

Has it met all design requirements?

Yes and much more. It's a very worthy replacement to the tube amplifier which has already been relegated from the shack. One side effect I did not consider with new amplifier is that it is much cooler to

continued on page 8

A Simple Portable L Shaped HF antenna for 20 and 17 metres

by David Conn VE3KL

(Note: This article uses TCA HotLinks to provide access to enriched media from the RAC website. For more information, please go to March/ April 2012 www.rac.ca/tca.)

Introduction

Every year the Ottawa Amateur Radio Club has a day that is dedicated QRP and portable antennas. We usually meet in September at a nice park in the city. I always find it interesting to see what our ingenious club members bring to the outdoor sessions. The antennas vary from very small ones such as a Buddy Stick to an antenna that is really big like a vertical 8 metres long mounted 4 metres above the ground using six radials at a height of 4 metres. Of course, we had a satellite radio on site as well. This year we worked mainly on 40 and 20 metres (CW and PSK31). The bands were quite good and the weather was beautiful.

These outings really demonstrate how important it is to have everything working well including the radio and its batteries, the antenna and its matching structures as well as being very proficient at working either CW or PSK31 modes. It takes a lot of work and planning to succeed at these events (similar to field day). Making lots of QRP contacts into Europe can be quite challenging. Local QRM is a real problem even at the 5 Watt level since we have no coordination of frequencies or antenna types. We just invite everybody to come out and have fun.

This year I made a special event home-brew antenna that was suitable for our outdoor use. My specifications ruled out all of the antennas that I had in my box of antennas so I had to make an antenna from scratch.

The design, description and performance of this antenna are presented in this article.

Specifications of the antenna

For this event, here is what I was aiming at:

- The antenna should work well for DX operation and have a reasonable take-off angle without being mounted too high above the ground.
- The antenna must be able to be set up in a park without the need of using my minivan as a support.
- The expected gain should be around or greater than zero dBi (similar to a vertical antenna) for low angle radiation.
- The antenna and its mounting structure (masts and ropes) must be capable of being set up easily by one person (no towers or high masts).
- The antenna should work well on 20 and 17 metres or higher bands now that 10 metres is open. I rejected 40 metre operation because several other club members use that band which is very popular for QRP portable operation.
- To keep things light, the antenna should not need a transmatch (antenna tuner). This means that the antenna should have an SWR of less than 1.5 in the CW portion of the bands. This constraint can be eased somewhat if you have a built-in-tuner with your rig that probably handles SWR levels up to 2.5.
- I usually avoid using ground mounted radials in a public park if possible.

The antenna

After ruling out many of the possibilities such as a halfwave horizontal dipole (too high), a ground mounted vertical with 10 or 12 radials, any form of beam antenna (too complex for an afternoon in the park), I decided on an L type antenna with no radials. To avoid confusion, I do not mean the Inverted L antenna type that is often used by low banders. The L antenna has been investigated by Cebik (see TCA Hotlink,1) but has not received much attention over the years.

Description of the Antenna

The diagram of the antenna is shown in Figure 1. The antenna

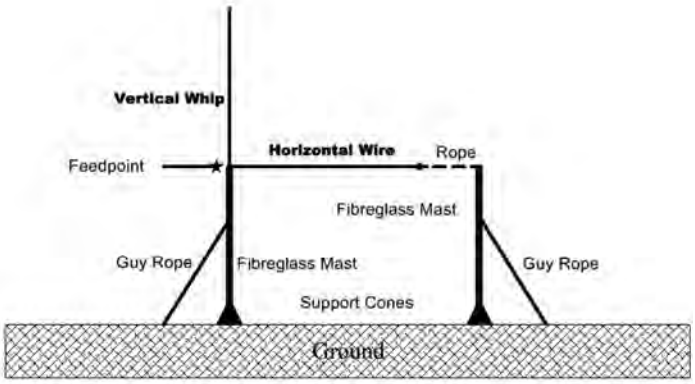

Figure 1. L-type portable antenna.

uses a vertical section made from telescoping aluminium tubing and an insulated horizontal wire (stranded #16 gauge copper). The vertical and horizontal sections are of equal length which sets the input impedance close to 50 Ohms.

The antenna sections are supported by two fibreglass masts which use two guy ropes each for support. Another rope is connected between the masts to complete the support. The details of the support masts are shown in Figures 2, 3. Notice that the masts are secured to the ground with the aid of two

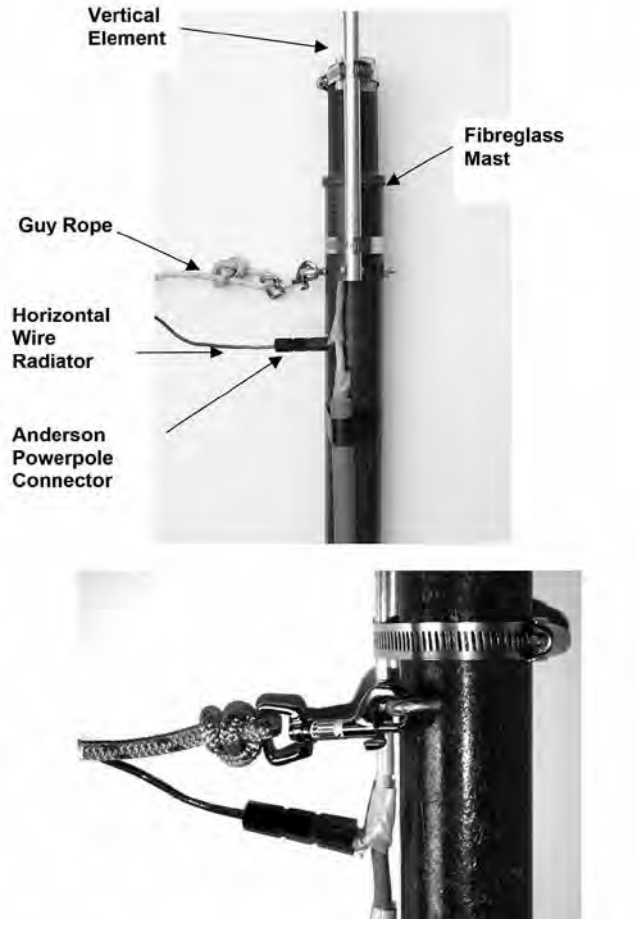

Figure 2. Antenna feedpoint photograph.

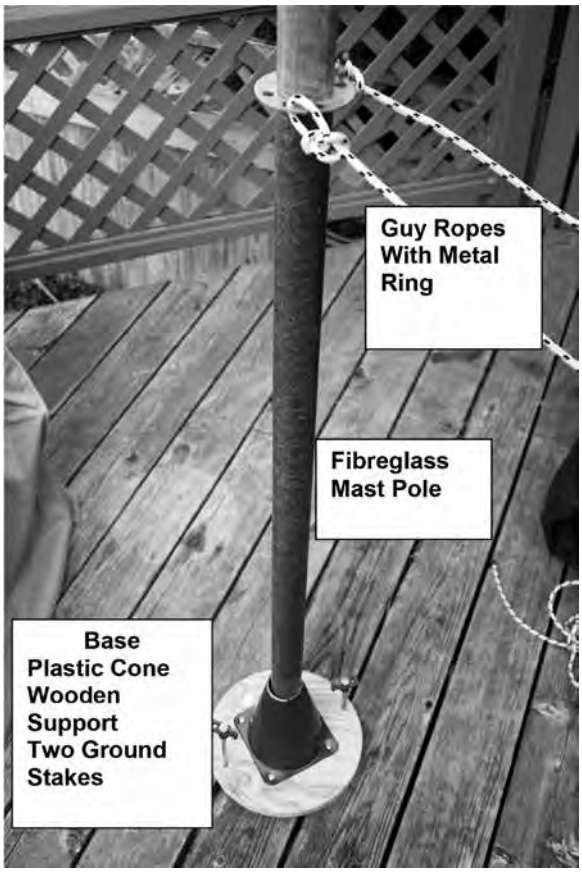

Figure 3. Antenna mast photograph.

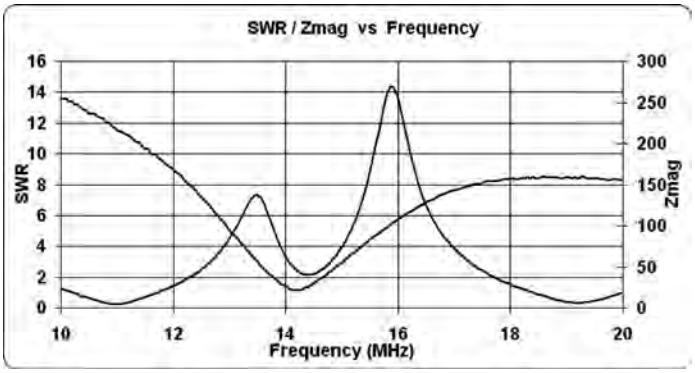

Figure 4. SWR measurement 14 MHz

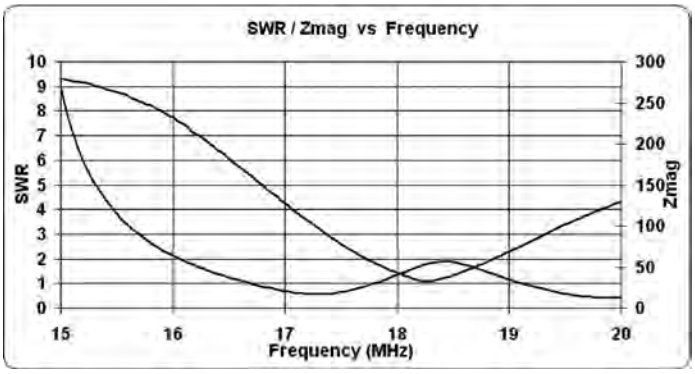

Figure 5. SWR measurement 18 MHz.

plastic safety cones, wooden supports and two ground stakes. These masts are made from two short sections that are coupled together making a total length of approximately 2.5 metres high. See TCA Hotlink,2 for more details on these masts. They can be substituted with other non-conducting masts which can usually be found at flea markets or hardware stores.The antenna is fed with RG8-X coaxial cable which has a conventional ferrite choke balun (five ferrite sleeves from Fair-Rite part # 2643540002) mounted near the antenna feedpoint. Note that I used an Anderson Power Pole connector to connect the horizontal section of the antenna to the outside conductor of the coaxial cable (see Figure 2). This was done to make the antenna easy to set up. For permanent antennas, I do not use these connectors.

Antenna dimensions

The antenna dimensions for operation in the 20 metre band are:

- Length of the vertical section = 5.15 metres.
- Length of the horizontal section to the coaxial cable = 5.15 metres.
- Diameter of the bottom tube of the vertical section = 12.7 mm (0.5 inches).
- The antenna dimensions for operation in the 17 metre band are:
- Length of the vertical section = 4.0 metres.
- Length of the horizontal section to the coaxial cable = 4.0 metres.
- Diameter of the bottom tube of the vertical section = 12.7 mm (0.5 inches).

The length of the telescoping sections is not critical at all. I recommend that you use three sections of equal length to make up the vertical section. In my case the first two sections are fabricated from tubes while the top section is a solid rod.

If tuning is required, leave the horizontal wire fixed and tune (slightly) the length of the vertical section since it is made from adjustable telescoping tubing (see *TCA Hotlink, 2*). I did not tune the antenna as the design worked well in the bottom edge of the bands for CW operation.

Antenna construction

This antenna is quite easy to build and can be made in many different configurations. The one that I built is quite rugged and can be made much lighter for casual operating.

The horizontal wire/guy rope is best constructed (see Figures 2,3) by first cutting a length of nylon rope 1 metre longer (including the clips) than length of the horizontal wire. Then cut the wire and tape it to the rope every 50 cm for support. Leave a little slack at the Anderson Power Pole connector so that it does not disconnect when moving in moderate wind loads.

The other parts of the antenna can be constructed as shown in Figures 2, 3 or by other techniques such as using a heavy duty photographic tripod that many people use with Buddy Pole and other antennas.

Antenna performance

The measured performance of the antennas is shown in Figures 4 and 5 where the SWR and magnitude of the impedance is plotted against frequency. These measurements were made with an AIM 4170 network analyzer connected to five metres of RG8-X that feeds the antenna. The first thing to notice is that an SWR of 1.1 at 14.2 MHz was achieved for the 20 metre antenna and an SWR of 1.09 at 18.3 MHz was achieved for the 17 metre antenna. Since the bandwidth of these antennas is quite large, I did not retune them for optimum performance in the CW portion of these bands.

Hence these antennas met my requirement of using a transmitter without the need of employing an antenna tuner. Of course, many new rigs now come equipped with built in tuners which can easily work with these antennas.

The simulated performance of these antennas is given in Figures 6 and 7.

Figure 6 shows the elevation plot for the 14 MHz antenna. The gain at 19 degrees of elevation is 0.65 dBi. The antenna is directive and emphasizes propagation in the direction of the horizontal wire away from the vertical wire. Also, the antenna has a lot of its radiation at high and moderate elevation angles making it good for not only DX but also for local communication (at the expense of overall gain compared with a dipole mounted one half wavelength above the ground).

The elevation plot for the 18 MHz antenna is basically the same except that its gain is 0.49 dBi.

Both antennas have a very deep null in the elevation plot as shown. However, this null is very narrow in the azimuth direction and does not have a significant impact on

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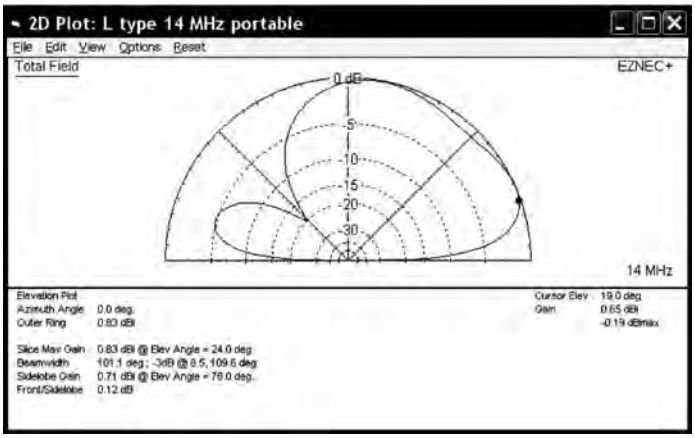

Figure 6. Far field plot 14 MHz.

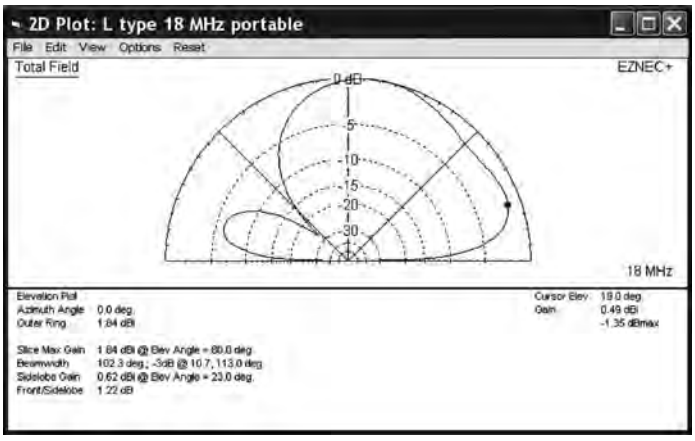

Figure 7. Far field plot 18 MHz.

the performance. To explore this in greater detail, I have included the EZNEC file on my web site. To find this file see TCA Hotlink,3. This file will allow you to scale the antenna to other bands up to at least 10 metres. If you prefer to tune the antenna without any simulation simply make the horizontal and vertical sections 0.24 wavelengths long at the required frequency. This will make a very good starting point for the antenna design.

In Operation

One of the most important considerations when using any portable radio system is safety. I ground my radio with a simple ground stake and surround the general area with commonly available small orange safety cones. I also put a sign near the station that explains what is going on and how to contact the Ottawa Amateur Radio Club and Radio Amateurs of Canada as well as my web site and email address. This sign and the cones are extremely effective and also encourage family members in the park to come over to hear the beep-beep of Morse code and PSK31. They are always amazed to hear that we are contacting amateurs around the world with small battery operated rigs.

This antenna (20 and 17 metre versions) performed as expected. During the club event, I worked several stations using 5 W from Scandinavia during a contest and many local and DX stations at a later time using 100 W of transmitted power.

The gain is at least 1 S unit below a halfwave dipole mounted one half wave length above ground for low angle radiation and another S unit below a 2 element Yagi.

Conclusions

The L type antenna holds its own as compared with other antennas for portable operation, especially very low (2.5 metres) short horizontal dipoles where the gain at low angles (19 degrees) is approximately 4 dB below the L antenna. It is important that the horizontal wire be at least 2.5 metres above the ground since the gain suffers badly as the height is reduced. The antennas that have been presented here are far from optimum with respect mechanical design. For portable operation the antennas can be very much lighter and employed in a very different fashion. For example, it might be used with only one main mast with the horizontal section connected to a near by tree.

Further study using TCA Hotlinks

Further information is provided with TCA Hotlinks which are easily accessed via the RAC website. For this information, please visit <http:// www.rac.ca/tca>. Hotlinks make it unnecessary to type URL addresses into your computer and provide you with calculators and other support that demonstrates the ideas presented in the articles. The following hotlinks for this article are available on the RAC site.

TCA Hotlink, 1 L. B. Cebik, W4RNL, L Antenna <http://www.antennex.com/preview/Folder01/lant/lant.htm>

TCA Hotlink, 2 Maple Leaf Communications <http://mapleleafcom.com/>

TCA Hotlink, 3 EZNEC Antenna File Under TCA Page <http://ve3kl.com/>

continued from page 5

use! On cold winter mornings this means the previous shack 'heater' in the form of the tube amplifier is missing and now replaced with a cool running version meaning I needed to dig out some additional shack heating but then that's a good thing right?! And with the switch mode PSU on the main 50 V supply it can cope with dips in the mains without suffering when the voltage drops. And without a big linear transformer in the box it no longer dims the lights on key down too! During operation the needle on the Bird hits 1 kW and stays there for hours without any drift or retuning needed. Perfect!

So what now? Well I have already built the 432 MHz version into the same style case to create a matching pair of amplifiers. And yes, with Jim's boards. I will write this up as soon as I have proven it but so far it performs in exactly the same way as the 144 MHz version.

If you're considering a new amplifier why not have a browse past Jim's website at <www.w6pql.com> and perhaps choose an LDMOS amplifier next time. You won't be disappointed I can promise you and it's a whole lot of fun learning some new skills along the way and saving some dollars too over a commercial amplifier. For those who feel uncomfortable about building an amp Jim can also provide ready built modules or even a fully built amplifier. So pop by his webpage and have a browse, just don't tell the XYL!

See you on the moon! 73 *Simon ZL4PLM*

References

[1] <http://www.Freescale.com/>

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Acknowledgements

The author wishes the thank Greg Danylchenko, VE3YTZ of the Ottawa Amateur Radio Club for organizing the QRP portable radio demonstration day in September 2011. This event motivated me to come up with a few new ideas about operating our radios in the field.

Until later, VY 73 *David, VE3KL*

Review of 70 cm Bandplan

In response to concerns expressed by a significant number of radio amateurs NZART Council has resolved that there is to be a review of the New Zealand band plan for the 70 cm band. A copy of the current NZART plan is appended below.

At the NZART Council Face to Face Meeting in Wellington on Saturday the 16 of February a working group was formed comprising of Councillors Warren Harris ZL2AJ, Neill Ellis ZL1TAJ and Phil King ZL1PK with members of FMTAG David Andrews ZL2SX, Doug Ingham ZL2TAR and Terry Thomas ZL4TAE. It is intended that it also be discussed at the 2013 Technology Convention over Easter in Auckland.

Submissions are invited from all NZ radio amateurs so that this can be achieved. Please send all submissions either by e-mail to <70cmreview@nzart.org.nz> or by posting to "70 cm Bandplan Review, NZART HQ, PO Box 40525, Upper Hutt 5140." All submissions should contain your call-sign and contact address.

Some matters you might like to consider in your submission are:

- Any issues with the current plan with a solution if possible.
- Amateur Television operation in the 70 cm band including both Digital and Analogue and the effects on weak signal operators on the band (Satellite, EME and DX).
- Interference to 70 cm operations from Low Interference Potential Devices allowed under the GURL.
- 70 cm Repeater inputs being in the frequency range of the Low Interference Potential Devices.
- Compatibility of our plan with the Wireless Institute of Australia plan, noting that Australia has an additional 10 MHz of spectrum (see below).
- Compliance with the IARU Region 3 plan (see below).
- Any significant usage or suggestions for future usage that is not covered in the current plan.

Please make your submissions by 20th April 2013.

70 cm Band; All licence classes

Band Allocation

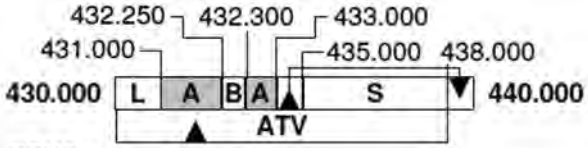
420 – 450 MHz RADIOLOCATION Primary Service
420 – 450 MHz FIXED, MOBILE Primary Service
420 – 430 MHz AMATEUR (no access from January 2013) Secondary Service
430 – 450 MHz AMATEUR Secondary Service
435 – 438 MHz AMATEUR SATELLITE Permitted on non-interference basis

Note: From January 2013, the 420 – 430 MHz band segment is no longer available for normal amateur operation.

430.025 – 430.975 REPEATER LINKS – Segment A (Note 7)
431.000 – 431.475 REPEATER LINKS – Segment B (Note 7)
431.500 – 431.900 RESERVED (Note 9)
431.600 – 431.700 Experimental
431.900 – 432.000 EME Guard band
432.000 – 432.600 NARROW BAND MODES (Note 1)
432.000 – 432.100 EME
432.100 – 432.400 CW / SSB
432.100 – Calling frequency: national primary
432.200 – Calling frequency: national secondary
432.220 – 432.240 Digital DX modes
432.240 – 432.300 Guard band: New Zealand beacons
432.300 – SSB chat frequency
432.320 – 432.340 Digital DX modes
432.400 – 432.600 Beacons (Note 2)
432.625 – 432.975 DIGITAL REPEATER INPUTS (Note 6)
433.025 – 434.975 FM SIMPLEX AND REPEATERS (Notes 4, 5, 6)
433.025 – 433.750 Repeater inputs – Group A
433.775 – 434.250 Simplex

Existing NZART 70 cm Bandplan

430.000 to 440.000 MHz – 70 cm
Amateur satellite permitted in the range 435-438 MHz. SSB calling 432.2 MHz, FM calling 432.5 MHz, Beacons 432.25-432.30 MHz. Primary packet/digipeater 432.65 MHz, other frequencies available. Repeater offsets -5 MHz in most cases, +5 MHz otherwise. In general, the ATV repeaters have an input frequency of 431.250 MHz vision, 436.750 MHz FM sound and 437.100 MHz NICAM sound

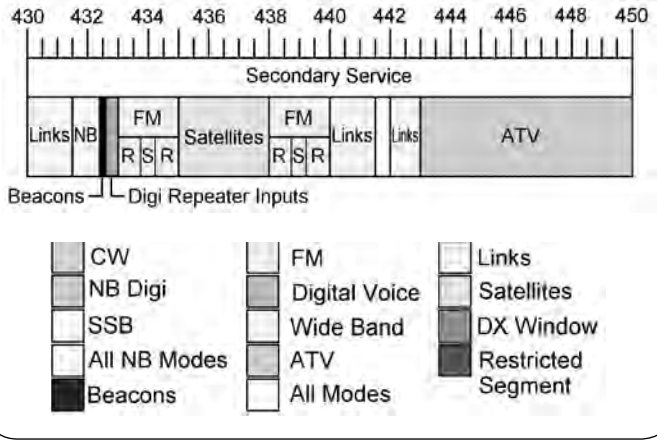


KEYS:-

- C = CW or modes less than 1 kHz bandwidth
- A = All modes with bandwidth less than 16 kHz
- AN = All modes with bandwidth less than 6 kHz
- AW = All modes
- D = Data modes with bandwidth less than 16 kHz
- DN = Data modes with bandwidth less than 6 kHz
- 1 = Standard 1 MHz narrow band segment
- = ATV repeater outputs only – 50 cm
- = Telemetry or telecontrol only – 11 metres
- = Repeater input band segment
- = Repeater output band segment

ATV = Amateur TeleVision, B = Beacons, FM = FM simplex, S = Satellites, L = Link

WIA 70 cm Bandplan



433.800 WICEN
433.900 Non-voice modes (RTTY, SSTV, Fax)
434.050 – 434.250 Packet Radio
434.275 – 434.975 Repeater inputs – Group B
435.000 – 438.000 AMATEUR SATELLITES (Note 3)
438.025 – 439.975 FM SIMPLEX AND REPEATERS (Notes 5,6)
438.025 - 438.750 FM Repeater outputs – Group A
438.025 – 438.375 Digital repeater outputs
438.775 – 439.250 Simplex
438.800 – WICEN

438.850 – National ARDF frequency
438.8875 – D-Star simplex 2
438.900 – D-Star simplex 1 (primary channel)
438.9125 – D-Star simplex 3 and hot spot channel
438.925 – D-Star Comms Site Elevated Hot Spot
438.950 – Recommended APCO P25 simplex frequency
439.000 – National FM voice calling frequency
439.050 – 439.075 Packet Radio
439.100 – APRS
439.150 – 439.175 Recommended for simplex IRLP/Echolink nodes
439.200 – 439.250 Packet Radio
439.275 – 439.975 FM Repeater outputs – Group B
440.025 – 440.975 REPEATER LINKS – Segment C (Note 7)
441.000 – 441.475 REPEATER LINKS – Segment D (Note 7)
441.500 – 442.000 RESERVED (Note 9)
442.025 – 442.975 REPEATER LINKS – Segment E (Note 7)
443.000 – 450.000 ATV (Note 8)

Note 1: Narrow Band Modes

This segment is reserved for modes such as CW, digital modes and SSB with bandwidths up to 4 kHz. Weak signal operation has absolute priority. Calling frequencies should be used only to make initial contact and then vacated as soon as possible. Please avoid any terrestrial operation within the EME segment. The "Digital DX modes" segments include recommended spot frequencies for SSB based digital modes, on the same pattern as in Note 1 of the 2 metre band plan.

Note 2: Beacons

Beacon frequencies are allocated on a call area basis, e.g. VK1: 432.410 – 432.419, VK2: 432.420 – 432.429 etc. Beacon frequency spacing is 2 kHz. The beacon segment should be kept clear of other transmissions.

Note 3: Amateur Satellites

The satellite segment should be kept clear of all terrestrial operation.

Note 4: LIPD Allocation

Stations operating between 433.050 and 434.790 MHz may experience interference from LIPDs ("Low Interference Potential Devices"). Repeaters have no protection from interference caused by LIPDs.

Note 5: Simplex

FM channel spacing is 25 kHz. Channels reserved for special purposes should be kept clear of other operation.

Recommended simplex frequencies: For D-Star digital simplex operation – 438.900 (primary), secondary 438.9125 (secondary), and 438.925 (simplex 3 and hotspot channel). For APCO P25 digital voice – recommended channel 438.950 (suggested Astro ID – ACMA Client Number; Network Access Code (NAC) – 293).

Note 6: Repeaters

FM repeaters: Channel spacing is 25 kHz, and offset is 5 MHz. Vacant repeater output frequencies can be used as simplex channels, but input frequencies should be avoided. Repeater channels reserved for WICEN portable repeaters: 438.275, 438.625, 439.925, 439.975 MHz.

Digital repeaters use channel pairs with output frequencies between 438.025 and 438.375 MHz, using a 5.4 MHz TX/RX offset. For areas where beacons are co-located with repeaters, Digital repeaters will be allocated to the upper end of the repeater segment, with 5 MHz offset and output frequencies on odd multiples of 12.5 kHz between 439. 8125 and 439.9875 MHz.

Note 7: Repeater Links

Conditions apply as per Note 6 of the 2 metre band plan. The 420 MHz link segment is unavailable in areas where some or all of the 420 – 430 MHz band has been assigned to non-amateur services. Segments A and C are the preferred link segments for use at most link sites. Segments A and E are 12 MHz offset pairs for use at sites where repeaters are co-sited with TX low links. Segment D is preferred for 11 MHz offset pairs for use at sites with multiple co-sited links that require frequency separation in both the 430 and 440 MHz segments.

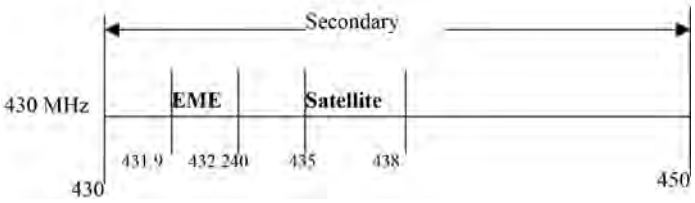
Note 8: Amateur Television

AM transmissions must be VSB only. Video carrier frequency 444.250 MHz. For digital ATV, the recommended standard is DVB-T using a 7 MHz bandwidth centred on 446.500 MHz.

Note 9: Reserved Segments

These band segments are reserved for future use for experimental and other purposes, including linear translators. The segment beginning at 441.000 MHz is reserved because the corresponding segment at 431 MHz is allocated to other purposes.

IARU Region 3 – 70 cm Bandplan



EME: Earth-Moon-Earth, Meteor Scatter, Auroral Scatter and other weak-signal modes.

Satellite: This segment should be kept clear of other operating modes.

The Basic Principles Underlying the IARU Region 3 Bandplan:

(1) In all cases of conflict between a bandplan and the national regulations of a country, the latter shall prevail.
(2) Nothing in these bandplans shall be construed as prohibiting different national arrangements, provided that harmful interference is not caused to stations in countries operating in accordance with the regional bandplan.
(3) Notwithstanding item 2 above, Member Societies of IARU Region 3 are strongly urged to use these regional bandplans as a basis for their national bandplans.

Adopted at the IARU R3 15 conference, Ho Chi Minh City, Viet Nam 2012

FMTAG – Frequency Management and Technical Advisory Group

Secretary: Doug Ingham ZL2TAR
<fmtag@nzart.org.nz>

FMTAG Notes

Proposals

None this time.

Final Recommendation

At its March 2013 meeting, NZART approved the following application:

ZL2WHO has applied for a 2-metre beacon at Waipuna, co-located with the existing 6-metre beacon, at TOPO50 BJ33 890.46 298.11. The frequency will be 144.271 MHz.

Comments and Applications

Please send your comments and suggestions on the above, and on any other FMTAG matters, by e-mail to: <fmtag@nzart.org.nz>

Applications for repeaters, beacons, digipeaters, point-to-point links, and so on, should be made on the latest version of FMTAG Form 10. The latest versions of FMTAG Form 10, and the explanatory Form 10A, are available on the NZART website: <http://www.nzart.org.nz/fmtag/index.html>

Completed forms should be sent by e-mail to <fmtag@nzart.org.nz>

Longer Wavelengths

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VK1DSH WSPR transmission received in France

WSPR [1] stands for "Weak Signal Propagation Reporter." This program is designed for sending and receiving low-power transmissions to test propagation paths on the MF and HF bands. Users with internet access can watch results in real time at WSPRnet[2].

WSPR is available in the regular two-minute mode and also a longer fifteen-minute version designed for MF use. In theory the fifteen-minute version should have a signal-to-noise advantage over the two-minute version but this depends upon the type of fading experienced. A series of shorter transmissions may get at least one message through whereas a longer one might not decode at all if fades are long enough. I found this to be the case receiving VK2DX (see below).

Andre F6NI noticed in early February that the 160 m path between EU and VK was very good and wondered if MF propagation was similar. Andre's QTH is in a city (with QRM), so he went to a nearby golf course of which club he was a member and set up a 500 m long beverage antenna pointing 80 degrees azimuth. With this he managed to receive one two-minute "spot" from VK1DSH just before the grey line sunset in France. The receiver was an IC7200 on 473.5 USB and a portable computer.

Dale VK1DSH was transmitting 50 W into a "T" type Marconi, approximately 10 m high and 26 m long. The antenna impedance was estimated at about 30 Ohms. The earth consists of ten earth stakes driven into the ground around the garden and connected by buried copper wire. The transmitter was an FT-817 driving a linear transverter with a PA stage consisting of a pair of IRFP-450 mosfets. Effective Radiated Power was approximately 100 mW.

Chinese standard time transmissions

Here is a relatively new time and frequency station now transmitting on a regular basis. This BPC on 68.5 kHz located in Shangqiu, China. The path length to ZL is similar to JJY40 and JJY60.

While we are on the subject of new LF stations, it seems JJY40 is back after being down for a few months after Fukushima disaster. JJY60 was on air all the time as it was not affected by the tsunami and related problems.

VK2DDI reports copy of the Russian station RBU at 66.6 kHz. I have not heard or seen this one yet.

Italy joins 630 m

The 630 m band has been made available in Italy although radiated power is limited to 1W.

An interesting case of ADSL QRM

Just after Christmas, I began experiencing extremely high levels of wideband noise on the lower frequencies. Initially I surmised that it was someone's Christmas present of an electronic gadget of doubtful parentage. The noise was evident even on a portable transistor radio tuned to the AM band when held anywhere near some parts of the house wiring, particularly the mains earth stake below the meter cabinet, and also anywhere near the telephone wiring.

It was especially strong near the power and telephone pole in front of my property. It was not evident at any other pole so I guessed it was local in origin. Switching off all equipment in my house made no difference so the source was concluded to originate from the immediate neighbour. Which was mysterious as the house was unoccupied at the time.

The noise was not continuous; it consisted of a "beep" followed by machinegun-like chatter followed by what sounded like random noise. The characteristics of the noise were that of an ADSL modem gone wrong. If you recall the preamble noises made by the older dial-up telephone modems, then this was very similar. Examining the noise on the spectrum display on my ICOM 746PRO revealed tones spaced at approximately 4.3 kHz (you have to be quick because they do not last long). The spectrum extended from very low frequencies (26 kHz) through to just above 1.1

Figure 1 – ADSL spectrum.

MHz, where it abruptly stopped. The noise changed audible character at around 138 kHz. This pretty much confirmed the noise as arising from an ADSL modem. In case anyone is interested, figure 1 shows the frequency allocation for the upload and download of data. More spectrum is available for download than upload (this is why it is called an asymetric digital subscriber line).

I also noticed that the noise would stop immediately after I transmitted on 630 m even at low power (0.4 W), and then restart shortly afterwards. After a while the noise increased in level by a few dB and became seemingly more resistant to my transmissions. As even quite high power transmissions (100 W) from my shack do not affect my own broadband facilities, this pointed to an imbalance in the neighbour's telephone line. The poor modem must have been vainly attempting to connect to the exchange even in the absence of people. This is also consistent with the modem increasing power to compensate for the lower signal-to-noise ratio and reallocating data into other 4 kHz channels. I understand ADSL modems are capable of delivering around 100 mW of RF power. With an unbalanced line (acting as an antenna) this would explain the high levels of QRM.

To cut a long story short, phone calls to various people were made and one day a linesman appeared and said that the neighbours were having trouble with their telephone. After that the noise disappeared, and has remained gone to this day. If it were not for the stop-start nature of the noise I would not have diagnosed it as an ADSL modem and would have blamed some cheap "parallel import". My internet also seems a lot faster now.

Interestingly, because the noise was present in the house and shack wiring I was able to reduce it by around 15-20 dB by adopting a range of noise cancelling techniques, but it was still at a level that would have made 630 m reception difficult from all but local stations (ie ZL2CA).

630 m band happenings

Murray ZL1BPU/ZL1EE has been transmitting WSPR on the 630 m band. He writes: "Getting on the new 630 m band is really not difficult, and it doesn't take high power to achieve good results. A simple transmitter like my ZL1QM designed one is quite enough. The most important things are a fair amount of copper wire, some patience, organization, and a certain amount of cunning.

Last night (Monday 25 February) I was operating as part of an organized test with a group of VKs. We were running the WSPR mode, which is a propagation probing system with incredible sensitivity (-30 dB S/N) and automatic reporting via the internet. The idea is that everyone runs the same software on the same frequency, and the internet server collects all the reception reports ("spots"). Results were very good, as you will see. In winter it will be even better.

WSPR transmits for exactly two minutes, a fixed message containing call-sign, location and transmitted power level, and these along with reception parameters are reported in the online database. You can set a suitable transmit/receive ratio (I used 30% transmit) and so listen for other stations between transmissions. For reception I use an active whip (modified PA0RDT design) and a Wandel & Goltermann SPM-12 selective level meter, feeding the computer sound card and WSPR software.

My transmitter is in a diecast box the size of a cigar box, and consists of two IRF510 FET's in push-pull running from 12 V. The driver is a TC4428, and I use an SSB exciter

continued on page 12

Letters To The Editor

All Letters to the Editor must be signed and include the author's full name, call-sign, (if applicable) and address. Opinions expressed here are those of the author and do not necessarily reflect official NZART policy.

Letters to the Editor: guidelines to contributors

Letters to the Editor should be concerned with Amateur Radio and normally not exceed 400 words. Break-In *follow the guidelines given on page 4-3 of the 2002-2003* Call-book *"Standards of language, and topics best avoided". Accordingly sex, race, religion and politics are not acceptable subject matter.*

Sir

Break-In, Electronic media and NZART membership

I'm sure you have already thought about this, but we need to bring it to the rest of the NZ Amateur Radio forum. It's now time to seriously think about migrating the distribution of *Break-In* from paper to an electronic media.

The reason this must happen is simply value for money. The costs of postage, paper, printing and handling keep rising and so does the age of the readership, which means that disposable income is shrinking.

Other major publications such as *QST* and *CQ* are, or will be, electronically distributed in the next few months. This has led to a reduction in costs to the point where the ARRL membership and *QST* is significantly below that of the NZART membership. In fact, for only a few dollars more than *Break-In* and a NZART subscription cost, you can have ARRL membership and *QST* and *CQ* subscriptions.

I accept that not everybody will take their reading as electronic, and it's not as relaxing taking the iPad into the smallest room in the house for a quick browse, but it is where the distribution has to go and for the next ten years you will need a tiered system of media; hardcopy only, hardcopy and electronic and electronic, but eventually electronic will be the only distribution.

Just look at what has happened to QSL cards. With free eQSL and others, more than 80% of my QSLs cost nothing for the paper or distribution. It leaves me a little to fund the few that need direct or bureau cards.

So why not embrace it now? We have plenty of smart people in NZ and it's not the first time it has been done. A major investment to get it set up will bring significant savings and increased value for us all.

This leads me onto the associated subject of NZART membership. If you start distributing *Break-In* via electronic means, what happens to the membership fees? As I said, the ARRL has more value for less cost, so we can't afford to price NZART and *Break-In* off the market.

I suggest a tiered system of membership as an interim step to full electronic distribution;-

- Full membership with a paper *Break-In* and *Call Book* (and electronic at no additional cost.)
- Full membership with an electronic *Break-In* and electronic *Call Book*.

This is bound lead to a little discussion and I look forward to the feedback.

73 *Jim ZL1LC*

***Editor's comments**: This question of an e-version was fully explored in the 2011 Readership Survey and a two-thirds majority of members wanted a printed Break-In to continue to be available. Similar responses were found in surveys by the RSGB and WIA. A key question is "How do you prevent plagiarism of an e-version ?"*

Sir

This from the RSM web site under: Reception Problems. Paragraph: How Can We Help ?.

"Protection is not given to weak or distant signals that have previously been receivable by good fortune, from changes that may occur in the radio environment."

I haven't seen this quoted in Break In nor elsewhere. It's to do with the C-Tick of course. A brilliant short single sentence. (I shall not comment on the composer's mother...). Perhaps it has gone unnoticed; we might highlight it in *Break In*. It's been on the RSM site for a few years now !

My Power company installed a Cellular Smart Meter at my home in 2008 and it feeds broadband hash into my house wiring which is then re-radiated and picked up by my antenna. Its Cellular MODEM generates a screech-modulated signal extending from 3 MHz to 6.8 MHz.

I cannot use 160 m or 80 m. My favourite SW band 4 MHz through 7 MHz is unusable. Our 40 m band however is unaffected as too the rest of HF other than constant 3 S-point hash. My AM broadcast reception on four radios has underlying hash due to cross modulation.

The RI at the time came with his C-Tick adjusted spectrum analyser and said the Smart Meter complies; that's it! The Power Company said and I quote " Sir, we don't understand your problem – what is short wave radio?" (There is more to that conversation: it would make your head shake.). It was all too hard for the NZART EMI man and I think he fell under the spell of the RI.

With proposals for Power-Line reticulated broad-band and other data that RSM sentence will haunt us and gives us no legal comeback at all. I think NZART needs to be aware of it.

73, *Lewis Jennings ZL3ADJ*

◂ *continued from page 11*

and 74HC04 squarer to drive it. The output is typically 5 – 10 W, depending on the antenna settings, but since the antenna is barely 1% efficient, not much is radiated. The antenna consists of three 6 m vertical wires bunched together, which extend into three 10 m long top wires. There are six radials of varying lengths buried under the grass, and connected together at the bottom of the tuner, which lives in a metal garden shed just outside the shack.

Results? Overnight there was a total of 73 "spots", from four different stations, all over 2000 km away. The furthest distance was to VK7TW, 2405 km, and not a fluke since he copied me six times. The strongest was -15 dB at VK2DAG, and the weakest -30 dB at VK7TW. Not bad for such a simple setup! "

Murray also has a much quieter receiving setup than I have at my QTH, and is able to receive VK WSPR stations at much higher signal-to-noise than I can. Since his report above, Murray regularly receives WSPR stations at –10 dB whereas the same stations are at best –20 dB at my QTH. Most of my poor signal-to-noise arises from splatter from broadcast station intermod at 477 kHz although I do wonder, in light of my recent ADSL QRM problems, if there is a festering background of electronic crud that is stealthily noising up the lower bands.

In spite of QRM from the broadcast station intermod at 477 kHz, I have recently received the WSPR transmissions of Nick VK2DX. This makes me Nick's greatest DX (just) at around 2200 km or so.

Digital modes on 630 m

G3ZJO has been receiving G6AVK at 100% copy using CMSK8 [3] on 475.500 kHz. Not exactly rare DX but then CMSK is designed as a "chat" mode. Most other activity on 630 m is of a one-way beacon nature, which has been criticised by some as being "appliance operation". Tuning is critical as the bandwidth is only 12.5 Hz and there is no AFC. CMSK was designed for use with non-linear amplifiers so is suited to LF/MF operation where most transmitters employ Class D type amplifiers for efficiency (and because they are easier to get going than linear amplifiers).

Late last year the CMSK8 transmissions of Murray ZL1BPU/ZL1EE were received in VK. A two-way contact has yet to be made.

630m net

The liaison net on 7170 kHz starts at 8:30 pm. Round robin tests on 473.1 kHz start about 10 minutes after check-ins are sorted for availability to transmit on 630 metres, 5 minutes each. Daylight saving ends on Sunday 7 April and that is usually a step to better sky wave signals between 8:30 and 9 pm.

Nets before daylight saving ends are scheduled as Thursday 21 March and Thursday 4 April. After daylight saving ends nets are scheduled for every Thursday. At some stage the liaison net will also go to 3666 kHz, depending upon how 7170kHz is affected by skip or DX QRM.

References

[1] <http://physics.princeton.edu/pulsar/K1JT/wspr.html>
[2] <http://wsprnet.org/drupal/wsprnet/spots>
[3] <http://<www.qsl.net/zl1bpu/CMSK/cmsk.htm>

New Zealand Association of Radio Transmitters Inc

National Conference

Copthorne Hotel, Masterton

Notice is hereby given that the Annual General Meeting of the Association will be held at the Copthorne Hotel and Resort, Solway Park, Masterton. Saturday 1 June 2013, commencing at 9 am.

Annual General Meeting Agenda

1 Welcome

2 Meeting Schedule

3 Apologies

4 Silent Keys

5 Confirmation of Quorum

6 Report on Council Business

7 Minutes 2012 AGM – Confirmation

8 Annual Accounts

9 Appointment of Association Auditor

10 Officers' reports as published in *Break-In*

11 Remits

12 Fixing of Venue For 2014 Conference

13 Presentation of Rothschild Cup

14 General Business

15 Presentation of Awards

16 Stirrer's Award

Debby Morgan ZL2DL
Business Manager

President's Annual Report 2012

My appointment to the position of President came about rather suddenly at the end of February with the resignation of Roy Symon ZL2KH. Sadly, Roy has now become a silent key.

This year was notable for the commitment we put into international activities. Our Administration Liaison Officer, Don Wallace ZL2TLL attended the World Radio Conference 2012 in Geneva, Switzerland in February. This WRC produced one very positive outcome for radio amateurs in the form of a new amateur band from 472 to 479 kHz. In May I was able to accept an invitation from the Wireless Institute of Australia to attend their annual Conference in Mildura, Victoria. I was in Melbourne at the time for a family holiday, so staying on for a few extra days in order to attend the WIA Conference kept the cost of my attendance to a minimum. This reciprocal exchange of visits in alternate years to our respective organisations has proved to be of great value to both the WIA and NZART and gives us the opportunity to explore joint activities. The WIA also lost a greatly valued worker in 2012 with the untimely passing of their President Michael Owen VK3KI.

In November we sent a team of three (John Lochhead ZL4QS, Terry Carrell ZL3QL and Don Wallace ZL2TLL) to the IARU Region 3 Conference in Ho Chi Minh City. Hosted by the Vietnam Amateur Radio Club, the conference took place between November 5 and November 9. Attendance at these conferences is an important part of our commitment to the on-going protection of the international amateur radio bands, and fosters cooperation between member societies within Region 3. A common goal for Region 3 member societies is to lobby their administrations to support a possible new amateur band around 5 MHz.

Following our very successful annual Conference and AGM held in Nelson, Council approved travel for me to go to Wanganui and make the presentation of Amateur of the Year to Barry Stewart ZL2RR. The presentation was made at a well attended Wanganui Branch 48 meeting. My thanks to Ivan Horn ZL2ATU for hosting me for the visit and for providing transport to and from Palmerston North airport. As noted above, the AGM and conference held in Nelson over Queen's Birthday Weekend was a very successful event. I would like to thank the Nelson Branch Conference team for all their hard work resulting in a very enjoyable weekend.

In the latter part of the year, Simon Lewis ZL4PLM decided to resign from Council and following a call for volunteers to fill the position, I was pleased to welcome Phil Holliday ZL3PAH to the Council team.

A membership drive in November/December drive gained us 246 new members, a very successful outcome. I hope that we will be able to retain many of these new members, made up of some members whose membership had lapsed and a number of amateurs who had not previously been a member of our Association. The challenge for 2013 will be to show that we are an organisation worth belonging to, and thus retain their membership.

Another success in 2012 was the production of a *Call Book* with remarkably few errors, thanks to the Ministry of Business, Innovation and Employment's Radio Spectrum Management Group who put a lot of effort into updating their amateur database. The full size *Call Book* and CD ROM was the result of many hours of work by Lorne Douglas ZL2AHB and his team. Thanks Lorne for a great job.

My thanks to those branches that send me a copy of their newsletter. I enjoy reading what's happening at other Branches and to note that there are amateurs out there who are having fun with our diverse hobby.

Finally I wish to thank our many hard working members who actively participate in our organisation and give of their best at all times. I'm sure you all know members, Officers and Councillors who work very hard to make a positive contribution to our hobby of amateur radio. Regrettably, there are always a small number of amateurs who will criticise, create difficulties and react negatively no matter what we try to do. To all of you who continue to work for the betterment of our hobby, my grateful thanks as we look forward to the new year of 2013.

Vaughan Henderson ZL1TGC President NZART

Business Manager/General Secretary's Annual Report 2012

Membership

	2011	2012
Transmitting	1682	1897
Non-Transmitting	17	18
Overseas Members	31	29
Complimentary/Associate Branches	127	83
	1857	2027

Headquarters

The above figures were current to 31 December 2013 and include 246 members who joined with the 2012 special promotional offer an excellent effort.

However as at 1 January we have 237 current members who have yet to pay their annual subscription. Considering the time, effort and cost associated with the recent promotion, I would be very keen to see these members renew so the Association can continue its growth throughout 2013.

I would like to take this opportunity to thank all those people who decided to join with this promotion, every little helps.

I printed and sent just over 3400 letters to all persons on the RSM database who were not currently members. There were a couple of glitches, where current members who held two call-signs received an invitation to join, however on the whole we do appear to have reached the majority. There are still a number of call-sign holders are incorrect as approximately 240 letters were returned to me.

As we become more technologically capable and use the computer for almost everything, it is very important, that if members choose to pay by direct credit to our bank account, that their Name and/or Call-sign AND their membership number is included as payment reference details. I have a few 'orphan' payments that I am unable to credit to the appropriate place as details are unknown.

I have undertaken a few roles which I and Council have been trying to find volunteers for. This impacts on my day to day work load, and while I do like visitors it would be appreciated if people could ring first and make a time to call. That way I can give you my almost undivided attention.

Debby Morgan ZL2DL Business Manager

Break-In Editor's Annual report for 2012

I am pleased to report that for this year *Break-In* has enjoyed a reasonable supply of copy covering a varied range of topics. This has allowed the publication of balanced and, I hope, interesting *Break-In*'s but mostly limited to 40 or 44 pages. It maybe a sign of the changing balance of more practical amateur radio activities but antenna-related articles have been predominant. A pleasing aspect has been an increase in features related to radio activities for younger newcomers to our hobby. On the debit side we are still unable to find volunteers to take over compiling the Short Wave Listening and QRP columns.

Unfortunately advertising from commercial sources has been limited but remained steady overall. Fortunately ICOM NZ still sponsor the inside front and outside back covers. In the absence of advertisers I have been able to use the inside back cover for colour pictures related to printed articles. Appeals to members with commercial connections have yet to generate more advertising; even low-key, low-cost "Classifieds" would be welcome. Once again, and contrary to some local opinions/suggestions, it has not proven possible to obtain advertising from overseas companies and/or organisations like ARRL and RSGB. The number of HAMADs also remains steady, with most of the HAMADS being for "Wanted" items.

This year saw a change of printers and typesetter but I am delighted to report that this went smoothly without problems, excellent service, and no increase in costs. I was pleased to be able to use four colour pages to cover the NZART Conference 2012 but from the editorial point of view using only a few colour pages is quite a difficult and time-consuming exercise since it has requires a fair amount of "juggling" to sort out which four, or eight, pages should be printed in colour. As a consequence I have not made strenuous attempts to include colour pages.

Editor; John R L Walker ZL3IB

Break-In Advertising Manager's Report for 2012

There has been a small increase in invoiced commercial advertising over the last year and the comparison is as follows:

2009	$10 001.14	excluding GST
2010	$8530.75	excluding GST
2011	$5978.00	excluding GST (no *Call Book* published)
2012	$6261.70	excluding GST

Icom NZ continue to be the main advertiser and their support is much appreciated. AvComm decided to withdraw their regular small ad in October for the time being.

The above figures do not include a small amount paid either by members who have used more than their 30 free words for Hamads or non-members who have paid for Hamads.

If any members know of a prospective advertiser, please contact me and I will be happy to provide them with costs.

Break-In Advertising Manager, Lorne Douglas ZL2AHB

Call Book Editor's Report for 2012

The preparation o*f Call Book* for 2012 was made much easier with the introduction of the Ministry of Business, Innovation and Employment Radio Spectrum Management's new software which is a browser based plug-in which allowed me to readily download the SMART Call-sign database. There are obviously still issues with Silent Keys but I can only encourage people to use the form on Page 2-2 of *Call Book* and keep it with their Will for forwarding to RSM and perhaps the problem will reduce over time.

I thank WIA for the opportunity to exchange *Call Books* and publish theirs on the *Call Book* CD.

Editor, Lorne Douglas ZL2AHB

HQ Info-Line Editor

A total of 18 full issues of HQ Info-line were prepared and electronically sent during 2012 with a further 2 special issues required to disseminate urgent information to members. This appears to continue to be a popular form of communication to members filling the gaps between each issue of *Break-In* being published.

I do urgently seek more material to be included in each issue as sometimes apart from the occasional overseas newsletters, some mail outs can be very limited news wise. Perhaps branches have upcoming activities that could be communicated through HQ –Infoline, if so please send to me at NZART HQ and I will place in the appropriate Info-Line.

Monitoring Service Coordinator – Annual Report 2012

Successes

There has been partial success in 2012: The removal of Radio Free Asia (RFA) from 21450 kHz, through the assistance of the attendees of the World Radio Conference (WRC 2012) and via the Radio Sector Policy Section of the Ministry of Economic Development (MED), which is now called the Ministry of Business, Innovation & Employment (MBIE). K1ZZ (Dave) the ARRL representative contacted the RFA broadcasters on Tinian Island to request that they cease broadcasting within the 15 metre Amateur Radio band. However, the RFA transmissions displaced the Chinese CNR1 Fire Dragon (Music) only transmissions from 0430z to 0500z and when this was not present a wide band signal jammer remained audible. The true RFA transmissions (voice only) transmissions still reside on 21 540 kHz.

I was invited and attended my first Radio Sector Policy meeting, during November and hope to attend these on a regular basis.

The NZART Top Intruder System Observer 2012 award was won by Phillip (ZL1TZE) for the second time, after Stephen (ZL1TPH) magnanimously stood aside.

Alleged Pirates

There has been no activity this year, which is good.

Complaints

Several complaints were received, in particular about the use of Pactor (digital mode) within the Amateur Radio spectrum associated with their use on 30 metres. The issue being that Pactor modems come in various types and speed capability. In good propagation conditions, the actual bandwidth used can exceed 3.4 kHz and of course obliterate any low bandwidth modes. There are a number of Pactor networks being operated including one to the Pacific Islands, which are either in automatic mode on a scheduled basis or used on a point to point basis. Still investigating, as these commercial units, this can only be deciphered by having a similar unit as there is no listen through mode with these systems.

Liaison

Last year's liaison within the Pacific region has remained constant through the year, but has also expanded into the HF DX scene (which adds an additional set of ears and eyes, when requested to assist.) Additional support from Region 1 has been maintained and is proving to be invaluable.

Good collaboration has been set up with the owner of the Signals. taurne.de digital (Leif) signal web site, which has been useful for identifying signal types.

Peter – Region Three Monitoring System Coordinator passed on the news about the latest Monitoring Service resolution in 2012, but as yet, there has been no indication, when these Resolutions will be enacted:

Resolution 11.1 for the Monitoring Service has been released. This means there will be changes with how the Monitoring System coordination. These include:

Member societies shall report details of the improper use of amateur bands by stations in their own country to their own national administration and take all steps possible to ensure that their administration acts to stop such improper use. Details of cases of established improper use of the amateur bands that cannot be resolved by the member society with its own administration shall be forwarded by the member society to its IARUMS Regional Coordinator.

Member societies and their National MS Coordinators are encouraged to report details of the improper use of amateur bands by stations in other countries to their own national administration so that their administration may raise the matter with the administration of the station concerned.

The major changes include a single coordinated web site for all Monitoring System coordination, which is likely to be centred on something like the current Region 1 web site. There also be a change in format for monthly reports, which will look very similar, if not the same as the monthly reports created by Region 1.

Monthly reports have been received regularly from Bob Knowles, ZL1BAD and Stephen Hayman, ZL1TPH (VHF Dxing intervening).

Voluntary Observers often contribute reports either via the Google IntruderWatch site or via the ZLDX and ZLHAM reflector sites, with audio samples, where possible.

Assisted with updates to the full NZART *Call Book*, which was issued in 2012.

Statistics

The table below indicates the number of intruders, reported within the Amateur Radio bands during 2012 based on monthly reports.

Band	Intruders
160 m	0
80 m	16
40 m	503
30 m	10
20 m	282
17 m	47
15 m	443
12 m	18
10 m	80
6 m	0
2 m	0
70 cm	0
Total	1399

Month	Bandwidth taken up in kHz
January	1225.7
February	940.4
March	1202.3
April	874.5
May	1042.5
June	1101.4
July	1511.6
August	1611.0
September	1650.4
October	616.6
November	1386.8
December	2082.5
Total	15245.7 kHz or 15.2457 MHz

The total amount of bandwidth taken up by intruders during 2012 is shown above, which mainly takes the form of Over the Horizon Radar (OTHR); Oceanographic systems (CODAR); and international military protocols.

A more detailed analysis will be carried out to graphically illustrate the different emissions and associate them with monthly reports and the extent of the problem.

However, a multitude of OTHR systems have been reported, including JORN like technology (a single tone ahead of a FMCW transmission burst, and sometimes associated with multiple pulse rates. There is still a large proliferation of Chinese, Turkish and British OTHR systems, along with CODAR systems, which are normally associated with their characteristic "swish swish" type audible sound, functioning at 2-5 pulses per second. There are OTHR systems, which sound remarkably like these systems, using low pulse rates, which are increasing.

The use of a Software Derived Receiver (SDR) has clearly identified the extent of military type transmissions systems called "HF Man Packs", which use Phase Shift Keying and frequency hopping techniques across the HF spectrum. These systems are commonly heard as short pulses between 6-8 in length in a speaker or headphones and according to the Australian Monitoring Service the source is to the North of New Zealand. On an SDR, these systems visually stick out like sore thumbs, and are very common across the Amateur Radio HF spectrum.

Equipment Inventory

No change

Suggestions for 2013

To investigate the possibility of providing a central remotely accessible receiver for those interested in radio, shortwave, propagation studies, as there is a lack of good resources for international and local visitors access the New Zealand wireless environment..

Continue to request assistance via Clubs and via reflector groups to raise the profile of monitoring activities and in particular encourage more reports for direction finding purposes. Direction finding with the clubs HF beam is perfectly feasible with the right techniques and existing equipment.

Encourage the use of Software Derived Receivers outside of New Zealand, for monitoring purposes.

Encourage DXers to report OTHR and Pirates by example to assist the Monitoring Service and Intruder Watch participants via DX Clusters – SK6AW offers additional start capabilities which include intruder key words i.e. OTHR, RADAR, BC, Pirate, CODAR etc.

Provide analytical results, and publish these results, so that more people actually the extent and impact of intruders within IARU Region 3.

John Martin ZL1GWE, MS Coordinator – NZART

National Training Officer's report 2012

This year, as seen by the ARX report, has been a quiet year in the way of training. I have had several requests for training material and guidance to the 2 day block training weekend. The training manual has been updated to match the changes in the question bank. The major changes here were to reflect the change in the government ministry from the Ministry of Economic Development to the new Ministry of Business Employment and Innovation.

I have had inquiries regarding the practical competency levels of new amateurs who have just passed the examination. This issue has been looked at and one solution being worked on is a practical training session. This session would not form part of the examination system but be over and above this.

It is unfortunate that there are not more branches are training new amateurs. Our hobby will die by natural attrition if new blood is not fed back in. This can only happen by recruiting and training new amateurs and then by continuing the training in relevant areas. This can include field day exercises, AREC events, contests, or branch buildathons. The alternative is to do nothing and fade.

I wish to thank anyone who has undertaken training within the hobby. I am available to assist any training class in the country in any capacity required. The future of our hobby depends on it.

Warren Harris ZL2AJ

NZART Reflector Moderator Annual Report

The NZART members mailing list has functioned relatively smoothly over the past year retaining similar subscriber numbers. My thanks to the participants for maintaining the level of ham radio focused discussion and their civility during policy discussions. I still believe an un-moderated list would best serve the organisation, but the continuedbehaviour of the group means minimal off-list intervention is required.

Jim Tittsler ZL2IA

Official Broadcast Annual Report 2012

February through December 2012 the NZART Official Broadcast was made at 8 pm and 9 pm on the last Sunday of the month on 3.9 MHz LSB, the UHF National System and a large number of two metre repeaters. A special Conference Official Broadcast was made live from the Nelson NZART Conference at 8pm on the Sunday of Queen's Birthday weekend. Throughout the year a team of helpers has ensured that Official Broadcast distribution occurred and has been available on the NZART Web page. To all involved my thanks and appreciation.

Regular Official Broadcast contributors for 2012 were the NZART President Vaughan Henderson ZL1TGC, NZART Business Manager Debby Morgan ZL2DL, Rosemary Boshier ZL1RO for WARO, Mike Newman ZL1BNB with reports of NZART Local Government Liaison Officer activity and Stephen McNeill ZL4HG with the NZART Branch News.

Selected items from the USA's Amateur Radio Newsline bulletin were used to give the broadcast an international flavour. My thanks as always to Bill Pasternak WA6ITF and the Amateur Radio Newsline for the permission to use their material.

Thanks also to Richard ZL1BOK for HF relay of the Broadcast, to David Scott ZL2BCA for local technical support and to Alan Wallace ZL1AMW for keeping the Official Broadcast up and timely on the NZART Web page.

Emailed Branch newsletters provide a valuable source of information. Remember, you may e-mail a copy your club's newsletter, or other information directly to the Official Broadcast. E-mail <zl6a@nzart.org.nz> it has never been easier!

Finally thanks to you the listener. If you have any comments or suggestions you wish to make about the Official Broadcast please drop me a line or e-mail <zl6a@nzart.org.nz>

Jim Meachen ZL2BHF

NZART QSL Bureau: Annual Report for 2012

Year 2012 saw an increase of around twenty per cent in numbers of cards sent out by ZL operators whilst there was around a twenty eight per cent increase in the number of incoming cards from overseas amateurs.

Details are:

Incoming Mail

DX	Packages/envelopes 178. Cards 45 033
ZL	Packages/envelopes 391. Cards 29 941

Outgoing Mail

DX	Envelopes 463, Parcels 3 (25 kg), (Cards 29 481)
ZL1 Bureau	55 kg of QSL Cards.
ZL2 Bureau	43.5 kg of QSL Cards.
ZL3 Bureau	20 kg of QSL Cards.
ZL4 Bureau	19 kg of QSL Cards.
ZL7T	6.6 kg of QSL Cards (Privately funded postage)

The NZART QSL Bureau's gross expenditure for this past financial year was $2304.78, an increase of $614.06 on the year ending 2011. The nett cost to the Association was $1900.05 as against $1222.32 for the previous year. Donations and non-member charges of $404.73 ($468.40 2011) made up the balance of the running costs of the Bureau for the year under review.

The 2012 year expenditure was severely impacted by the NZPO's abolition of the 'Economy Mail' option in October 2011 as well as the peaking of the sun spot cycle. Special ZL call-sign stations were very active during 2011 and these activities generated extra input through the Bureau system this year.

A 5 kg parcel of QSL Cards posted to the ZL1 prefix Sub-bureau in October 2012 went astray and has not been tracked down at the time of this report being compiled.

The Association's sincere thanks go to those of its members who, from time to time, saw fit to enclose a donation with their QSL cards. Their generosity has helped to keep down the Association's day to day running expenses.

My thanks go to our four Sub Bureaux managers; namely Ross ZL1BGB, Tony ZL2AGY, Ken ZL4HU and Dave ZL4OZ, who attended to the stuffing of envelopes for all of the 'deserving' during 2012.

BE Stewart ZL2RR, Manager

Administration Liaison Officer's Report for 2012

2012 was a year dominated by conferences, starting with the 4 week World Radio Communications Conference in Geneva followed by the NZART conference in June and the 1 week IARU Region 3 conference in Vietnam in November. There were also a number of different matters requiring submissions to, or discussions with, the Ministry of Business, Innovation, and Employment.

130 kHz

In 2011, NZART put in a submission (see HQ Infoline 31s) stating we had no objection to the proposed change to increase the allowable power for short range devices in the 9-190 kHz band but making suggestions as to how this should be implemented. As expected, the Ministry, in early 2012, approved the change and agreed that the current compliance and radio standards regime (the system that has replaced "type approval") should continue.

500 kHz (or 600 metres) Allocation

As members may be aware, the band 472 kHz to 479 kHz was allocated to the Amateur service for use on a secondary basis at the World Radiocommunication Conference (WRC) held earlier the year. We have agreed the following basis with the Radio Spectrum Policy and Planning Group of the MBIE for access to this band:

Frequency range: 472 kHz to 479 kHz

Type of allocation: Secondary

Power Output: 25 W eirp

Bandwidth restrictions: None (the previous 200 Hz limit is removed)

Amateurs will continue to have access to the current temporary allocation at 505 – 515 kHz until the end of 2013 to allow them some time to retune and/or rebuild existing equipment.

Potential 5 MHz Amateur Allocation

Many countries have an allocation (generally a number of spot frequencies) in the 5 MHz area. At WARC 2012, it was agreed to include an international Amateur allocation at 5 MHz on the agenda for the 2015 meeting. This will involve:

- Studying spectrum required for a secondary allocation between 5.25 & 5.45 MHz;
- Carrying out sharing studies on the impact to other services;

In InfoLine 253 I asked for those with an interest in assisting with the NZ end of such studies to contact me and a number of people have volunteered. I plan this year to see what we can achieve in NZ to assist the international effort.

Amateur use of 50 to 51 MHz

As members are aware, the bottom end of the 6 metre band (50 to 51 MHz) is to be returned to Amateurs once all Channel 1 television has ceased and the current management right for this expires. As noted in Infoline 260, the last channel 1 television transmitter is not due to close down until November 2013 and the management right under which they operate does not expire until August 2015.

We are working with Radio Spectrum Management on arrangements for the period between when all the Channel 1 transmitters are turned off and the management right expires but, in the interim, the current arrangements will continue - an amateur wishing to transmit between 50 and 51 MHz needs a permit to operate from Radio Spectrum Management.

Amateur Television Repeater Output Frequency

As expected, many Channel 39 analogue ATV licences were cancelled during 2012 and the balance expire towards the end of 2013. We have been working cooperatively with MBIE on an alternative digital allocation at 502 MHz to 510 MHz and testing is currently underway to check compatibility between Digital ATV and adjacent spectrum users.

Amateur Information in SMART

The Ministry continued their efforts during 2012 to clean up Amateur information in SMART. While the information is still not perfect, the 2012 *Call Book* has significantly less errors than the previous one.

Radio Spectrum Five Year Outlook Discussion Paper

During the year the Radio Spectrum Policy and Planning Group at MBIE published their Radio Spectrum Five Year Outlook Discussion Paper. We expressed our support for their plans and, in particular, their intention, as part of their international work, to focus on the allocation of additional spectrum for use by the Amateur radio service.

We also supported their proposal to improve their efforts to deal with interference to radio communications from electrical equipment, and the importation of prohibited and non-compliant equipment and suggested the aims should also include:

- preserving, where practicable, Amateur allocations to allow them to continue to:
- participate in self-training, intercommunication & technical investigations; and
- provide disaster communications;

where this is not practicable, arrange for appropriate alternative spectrum (e.g. the current work on finding an alternative ATV output frequency) to be made available to Amateurs.

World Radio Conference 2012

As members will be aware, I was privileged to be included in the NZ delegation to WRC 2012 in Geneva. The main topics discussed (see *Break-In* March/April 2012 for details) were:

- Proposed 500 kHz (or 600 metres) Allocation
- Proposed Oceanographic Radar Allocations
- Proposed 2015 Agenda Items
- Potential 5 MHz (or 60 metres) Amateur Allocation

  Two potential threats to our allocation at 10 GHz;
- A potential threat to our allocation at 24 GHz; and
- A potential threat to our allocation at 77.5-78 GHz ;
- Proposed 2018 agenda item for allocation for (commercial) micro and pico satellites

IARU Region 3 Conference

As members may be aware, I was included as an observer in the NZART delegation to the 2012 IARU Region 3 conference in Ho Chi Minh City (Saigon). A full report on the conference by John Lochhead, our IARU Liaison Officer was included in the November/December 2012 issue of *Break-In.*

Deputy ALO

I am pleased to advise that John Yaldwyn, ZL4JY, has agreed to take on the role (in addition to his AREC roles) of Deputy ALO.

Thanks

I would like to thank the large number of people who have contributed, formally or informally, to many of the matters discussed above – it would not be possible to carry out my role without their contributions.

Don Wallace ZL2TLL Administration Liaison Officer

NZART Radioscience Education Trust; report for 2012

Once again a rather disappointing year with no prizeworthy exhibits reported from the twenty plus Science and Technology Fairs throughout New Zealand. It is an increasing cause for concern that several judges reported that very few exhibits had an 'electronics" theme and still fewer any sort of relationship to 'radio'. Consequently several branches commented that they no longer felt it worthwhile to be involved with this activity.

Procedures for sponsorship involve direct liaison between Branches and local Area Science & Technology Fair Coordinators and under this arrangement Branches are reimbursed by the Trust if and when a prize is awarded. The Trust has also decided to contribute up to $20 to the running costs of the local Fair. However; the problem of getting up-to-date contact information to Fair Coordinators, and sometimes Branch Secretaries, is an on-going problem. It must be stressed that judges must be licenced radio amateurs and should be appointed by the local NZART branch.

There is still an urgent need to promote our activities amongst the science tutors of our secondary schools. Science teachers are those closest to the students and it's to them we should target attention. The NZART web pages now have a Trust section to promote the Trust and assist schools and Branches.

The Trust's income for the year 2012 was $3019 and our Bank Balance at the end of December was $10,521. For the past four years the Trust has also offered "Grants-in-Aid" of up to $250 to support specific projects in schools or organised by NZART Branches and it is most disappointing that so few schools have taken advantage of this offer. Maybe branches could do more to publicise this offer?

In 2011 the Trust was pleased to support the AMSAT-ZL KiwiSAT Microsatellite Project led by Dr Johan Potgieter of the Massey University Albany Campus. This was to fund a study grant for four students to work on the Attitude Determination and Control (ADAC) scientific experiment. This year the Trustees were pleased to be able to continue support for this project and look forward to assisting future projects of this nature.

In Christchurch and Nelson the Trust has supported several "Buildathon-type" and "RadioTek"projects. These have been very successful in bringing young people a "hands-on" approach to radio and electronics and we hope that more branches will undertake projects of this nature. Reports on these excellent programs have been published in earlier issues of "*Break-In*". The Trustees wish to thank those participating branches of the Association that have taken the time and effort to promote the NZART Radioscience Education Trust. The rewards in helping the young people of New Zealand to a possible future in Radio and Electronics, are well worth the effort involved.

Trustees: Terry Carrell ZL3QL, Grahame Fraser ZL3SJ,
Peter Norden ZL2SJ, John Walker ZL3IB

NZART ARX & Examination Coordinator Annual Report 2012

I am very pleased to be able to report that the full review and updating of NZART Examination Database is now complete and approved both by NZART Council and Radio Spectrum Management. This was advised via HQ Info-line on the 18 January 2013. The link for this…<http://www.nzart.org.nz/exam/download-examination-files/>

I urge ALL Examination Supervisors to please download the new software as a test to ensure it runs correctly on your computer.

All study material is presently being rewritten to include the changes.

Sincere thanks goes to Warren Harris ZL2AJ, my Deputy NZART ARX, Dr Gary Bold ZL1AN, Councilors and all who have worked so hard to be able to bring this to completion.

The following are examinations results for 2012

Results are as follows:	2011	2012
	70	46

A poor result from previous years.

These figures include only those examinations sat through the NZART system. There are other agencies conducting examinations and issuing call-signs, however we do not know the results from these.

To all those ARX's I ask that you encourage these new candidates to join NZART.

SMART Statistics 2012

	2011	2012
New/Lapsed/Overseas Call-sign applications	82	64
Secondary/Amended Call-sign applications	12	18
Special Event Calls/One letter calls	18	8

Debby Morgan ZL2DL ARX 2086
Debby ZL2DL, HQ Info-line editor

AREC Report 2012

Funding from the NZ SAR Council and the NZ Police has continued over the period allowing AREC to continue upgrading equipment around the various AREC Sections.

E-Text continues to be used for alerting Section Leaders to call outs and monthly nets. The system works very well and has any message sent delivered with no more than 15 seconds delay.

Operational reporting has been better this last year so keep up the good work .

Some sections of the AREC Manual have been revised and the complete manual will soon be available on the AREC Website.

Many hours of operational work have been provided to SAR and I would like to thank those who have willingly given their time.

As well a considerable amount of valuable training has occurred with members providing safety comms for various sporting events through out the country.

Jeff Sayer AREC National Director ZK 6EX

Awards Manager's Report

The total number of awards issued in 2012 is down again on the previous year. Once again the IARU Region 3 was the most popular with a total of 26 certificates being issued. Other awards issued 12 WAP, 3 CJC, 1 VHFCC, 2 WAZL and 1 Tiki making the overall total of 45 awards issued last year.

Alan Chapman ZL3GX NZART Awards Manager

CHARTERED ACCOUNTANTS

PARSONS RODDICK & CO

Independent Auditor's Report

To the Members of the New Zealand Association of Radio Transmitters Incorporated.

We have audited the financial report on pages 1 to 8. The financial statements comprise the Statement of Financial Position as at 31 December 2012, and the Income and Expenditure for the year then ended, and a summary of significant accounting policies and other explanatory information.

Officers Responsibility for the Financial Statements

The officers are responsible for the preparation and fair presentation of these financial statements in accordance with generally accepted accounting practice in New Zealand and for such internal control as the officers determine is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibilities

Our responsibility is to express to you an opinion on these financial statements based on our audit. We conducted our audit in accordance with International Standards on Auditing (New Zealand). These standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the New Zealand Association of Radio Transmitters Incorporated preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the New Zealand Association of Radio Transmitters Incorporated internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Other than in our capacity as auditor we have no relationship with, or interests in, the New Zealand Association of Radio Transmitters Incorporated.

Unqualified Opinion

In our opinion the financial statements on pages 1 to 8 comply with generally accepted accounting practice in New Zealand, and give a true and fair view of the financial position of the New Zealand Association of Radio Transmitters Incorporated as at 31 December 2012, and of its financial performance for the year then ended.

Parsons Roddick & Co

Parsons Roddick & Co
21st March 2013
UPPER HUTT

NEW ZEALAND ASSOCIATION OF RADIO TRANSMITTERS Inc

Statement of Financial Position as at 31 December 2012

2011		Note		2012
	Members Funds			
237,314	Balance as at 1 January 2012			241,090
3,776	Add movements in reserves	13		(26,574)
241,090				214,516
4,647	Conference Expense Fund			4,647
1,131	Non Sponsored Awards Fund			1,131
$ 246,868	**Total Members Accumulated Funds as at 31 December 2012**			**$ 220,294**
	These Funds are Represented by :			
	Current Assets			
32,308	Bank of New Zealand - Current Account		14,114	
271,940	Bank of New Zealand - Deposit Accounts	6	304,701	
9,959	Westpac Trust - AREC Imprest Accounts		10,691	
24,649	Westpac Trust - Deposit Account	6	-	
216	ANZ Bank - Break-In Imprest Account		177	
5,687	Public Trust - Deposit		5,744	
6,958	Accounts Receivable	7	2,759	
587	Bookshop Stock	9	-	
1,647	Provision for Tax	8	1,534	
3,339	Prepayments		923	
357,190	**Total Current Assets**			**340,643**
	Less Current Liabilities			
7,676	Accounts Payable		14,574	
80,554	AREC Balance held	10	75,128	
104,413	Subscriptions received in Advance	11	126,847	
192,643	**Total Current Liabilities**			**216,549**
164,547	**Working Capital**			**124,095**
82,321	**Fixed Assets (as per Asset Schedule)**	12		**96,199**
$ 246,868	**Net Assets**			**$ 220,294**

NEW ZEALAND ASSOCIATION OF RADIO TRANSMITTERS Inc

Statement of Financial Position as at 31 December 2012

2011		Note		2012
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357,190	**Total Current Assets**			**340,643**
	Less Current Liabilities			
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$ 246,868	**Net Assets**			**$ 220,294**

NEW ZEALAND ASSOCIATION OF RADIO TRANSMITTERS Inc.

Association Assets as at 31 December 2012

Head Quarters	Cost 01/01/2012	Additions	Total Cost 31/12/2012	Depreciated Value 01/01/2012	Current Year Depreciation	Depreciated Value 31/12/2012
Furniture, Fittings & Equipment	2,423		2,423	313	149	164
Computer Hardware	4,722		4,722	464	109	355
Computer Software	4,445		4,445	1	-	1
Leasehold Improvements	1,212		1,212	304	121	183
	12,802		12,802	1,082	379	703
AREC						
Radio Equipment	108,744	35,716	144,460	81,239	23,665	93,290
Computer Equipment	-	2,282	2,282	-	76	2,206
	108,744	37,998	146,742	81,239	23,741	95,496
Total Association Assets	**$ 121,546**	**$ 37,998**	**$ 159,544**	**$ 82,321**	**$ 24,120**	**$ 96,199**

NEW ZEALAND ASSOCIATION OF RADIO TRANSMITTERS Inc

ACCOUNTING POLICIES FOR THE YEAR ENDED 31 DECEMBER 2012

1 Financial Reporting

The Association qualifies for certain disclosure exemptions under the New Zealand Institute of Chartered Accountants Framework for Differential Reporting because it is not publicly accountable and size (as defined in the Framework). The New Zealand Association of Radio Transmitters Inc has taken advantage of all financial reporting exemptions.

2 Measurement Base

The Accounting principles recognised as appropriate for the measurement and reporting of earnings and financial position on a historical cost basis have been followed by the Association.

3 GST Basis

These financial statements have been prepared on a GST exclusive basis.

4 Changes in Accounting Policy

There have been no changes in accounting policies. All policies have been applied on bases consistent with those used in previous years.

NEW ZEALAND ASSOCIATION OF RADIO TRANSMITTERS Inc

Financial Notes for the Year Ended 31 December 2012

Note

1 Subscriptions

2011		2012
136,470	Gross Subscription Received	124,030
(17,863)	Less rebates taken	-
$118,606	**Net Income from Subscriptions**	**$ 124,030**

2 Publications

2011			2012
1,016	Total Sales		1,169
434	Stock on Hand 1 January 2012	587	
422	Add Purchases	394	
856		981	
587	Less Stock on hand - 31 December 2012	-	
269	Cost of Sales		981
$ 747	**Excess Income over Expenditure**		**$ 188**

3 Examinations

2011		2012
83	Income	-
-	Less Costs Incurred	-
$ 83	**Net Income from Examinations**	**$ -**

4 Head Quarters Operating Costs

2011		2012
-	ACC Levy	237
1,175	Bank Charges	1,237
-	Business Managers Expenses	-
-	Business Management Committee Expenses	-
120	Computer Repairs & Maintenance	634
143	Computer Software Support	-
590	Depreciation	379
428	General Expenses	386
2,776	Insurance	3,490
767	Internet & Email	722
152	Office Expenses	152
3,567	Photocopying	4,358
1,320	Postages & Couriers	2,111
1,544	Printing & Stationery	4,666
8,092	Rent	7,557
-	Repairs & Maintenance	
36,681	Salaries	41,503
412	Security	446
1,313	Telephone & Fax	1,352
$ 59,080		**$ 69,232**

NEW ZEALAND ASSOCIATION OF RADIO TRANSMITTERS Inc

Financial Notes for the Year Ended 31 December 2012

Note

5 Break-In and Call Book

2011	Expenses	2012
4,924	Editorial Fees and Expenses	6,265
49,276	Typesetting, Printing and Distribution	46,071
-	Callbook	20,543
54,200		**72,880**
	Less Recoveries	
7,668	Advertising & Sales	7,536
$ 46,532	**Net Cost of Providing Break-In and Call Book**	**$ 65,344**

6 Bank Deposits

	Term	Matures	Interest Rate
BNZ - Achiever Savings Account	On Call		0.50%
BNZ - Deposit Account - 3009	180 days	15-Mar-13	3.60%
BNZ - Deposit Account - 3011	60 days	14-Jan-13	2.75%
BNZ - Deposit Account - 3012	30 days	30-Jan-13	2.75%
BNZ - Deposit Account - 3015	180 days	23-Feb-13	4.25%
BNZ - Deposit Account - 3017	60 days	17-Feb-13	2.75%

7 Accounts Receivable

The Balance of the Accounts Receivable is considered to be totally collectable.

There is no Provision for Doubtful Debts

8 Provision for Taxation

Taxation was provided on Interest and Dividend Income.

2011		2012
8,674	Income Assessable for Taxation	**7,472**
2,429	Taxation at $0.30	
-	Less Taxation overprovided in Previous Years	-
2,429	Tax Expense	**2,092**
(3,221)	Less Resident withholding Tax Already Deducted	(3,626)
(854)	Add Provision for Previous Year	-
$ (1,647)	Provision for Taxation at 31 December 2012 (- Refund)	**$ (1,534)**

NEW ZEALAND ASSOCIATION OF RADIO TRANSMITTERS Inc

Financial Notes for the Year Ended 31 December 2012

Note

9 Bookshop Stock

Stock on hand as at 31 December 2012 was valued at cost.

10 AREC

2011			2012
31,376	**Balance as at 1 January 2012**		80,554
-	add Police Grant		-
70,000	NZART AREC Emergency Funds Trust		21,676
1,126	Sales (Jerkins & Manuals)		7,840
102,502	**Total Resources**		**110,070**
	Less AREC Expenses		
650	Administration	650	
1,829	Conference	680	
14,901	Depreciation	23,741	
1,739	Equipment Subsidies	875	
541	Insurance Subsidies	1,348	
651	Other Costs	2,668	
-	Printing & Stationery	94	
1,250	Training Costs	1,266	
387	Travel	865	
-	Vehicle Registration Subsidies	2,755	
21,948			**34,941**
$ 80,554	**Balance as at 31 December 2012**		**$ 75,128**

11 Subscriptions in Advance

1801 of the 2027 members had paid their subscriptions for 2013 prior to 31 December 2012

The amount of Subscriptions in Advance is made up as follows :

2011		2012
97,529	Gross Subscription for the **2013** Financial Year	129,299
-	Less rebate	(10,414)
97,529		**118,885**
$ 6,884	Members Credit Balances as at 31 Dec 2012	**$ 7,962**
$ 104,413	**Total Subscriptions received in advance**	**$ 126,847**

NB. These figures are exclusive of GST.

Note

12 Fixed Assets and Depreciation

The Inland Revenue Department now allows for the purchase of assets with a value of less than $500.00 to be expensed in the year of purchase.The Association has taken advantage of this concession but reduces the value of the asset to $1.00 while that asset is utilised within the Association.

Depreciation has been charges at the rate approved by The Inland Revenue Department for Taxation purposes. The straight line method based on the assessed remaining economic life of all the items estimated at:

Printers	10 years
Office Chairs	10 years
Brother Printer	10 years
Fascimile	5 years
Computer Hardware	5 years
Computer Software	3 years
Leasehold Improvements	10 years
Radios (AREC)	5.7 years

See schedule of Assets and Depreciation for specific details.

13 Movement in Members Funds

2011		2012
237,314	**Balance as at 1 January 2012**	241,090
3,776	Add Excess Income over Expenditure	(26,574)
241,090	**Total Resources**	**214,516**
-	Less Allocated to Specific Funds (Non Sponsored Awards)	-
$ 241,090	**Balance as at 31 December 2012**	**$ 214,516**

Remits

Remit 1: Constitutional Manawatu Branch 20

That clause 6.4 of the NZART Constitution be amended by the addition of a new sub-clause 6.4 c. requiring all voting on remits at a general meeting to be by actual count of votes. Old sub-clauses c through g are re-numbered to reflect the insertion of the new sub-clause c.

6.4 Voting at General Meetings

a. Voting on any remit or other motion at a general meeting must be conducted in any one of the following ways at the discretion of the Chairperson –
   i. by voice,
   ii. by show of hands,
   iii. by actual count of votes.

b. Notwithstanding subparagraph 6.3 d. and subparagraph a. above, the Chairperson at a general meeting has a discretion (where appropriate) to accept votes by acclamation, and to allow a less restrictive voting eligibility on matters that concern only the persons at the meeting, and on matters of routine or minor importance.

c. Notwithstanding clauses 6.4 a and b above, Voting on any remit at a general meeting must be conducted by actual count of votes.

d. The declaration of a result by the Chairperson is final and must be accepted by all members as conclusive of the result of the vote and the fact that it has been passed with any necessary majority, provided that if the result is declared on the basis of a vote by voice or by show of hands, any delegate or member may before the meeting proceeds to the next business require the vote to be retaken by a poll of votes.

e. Unless otherwise specifically required by law or by this constitution a majority of those represented and entitled to vote at any general meeting determines any question.

f. Branch delegates or proxies when voting on any matter before the general meeting are entitled to exercise one vote for every financial member of the Association attached to that Branch for voting purposes by the General Secretary, provided that if any member of the Branch being present in person indicates to the chairperson prior to the first vote conducted at the meeting, that the member wishes to vote in person, that member may do so, and the Branch vote is to be reduced accordingly.

g. The General Secretary must certify to the general meeting the number of votes a Branch is entitled to exercise and the certificate of the General Secretary to the meeting (whether or not in writing) is conclusive.

h. The vote of a Branch delegate at a general meeting is conclusive and may not be impeached or challenged by the meeting or any person at the meeting upon the grounds that the delegate is acting outside the instructions given by the delegate's Branch.

Explanation:

Currently remits are often won or lost on voice. Some motions are in no doubt, however others appear closer. With branches having: different voting weights, delegates representing various branch interests, and split votes within branches, it is considered too inaccurate to record issues as important as remits to be won or lost on a simple voice vote. This remit enforces an actual count, eliminating non delegates votes to confuse the mix, and the advantage the "nay's" have to beat the "ayes". The remits can be put, discussed, and then voted on using a pre-formatted form, after the votes have been tallied the results can be given. One way this could occur is for voting to be performed via a pre-formatted voting form, At the end of remit time, voting forms can be handed in to be counted while the meeting continues. The meeting carries on its business, with the results announced later in the meeting so as not to hold proceedings up. This will allow the meeting to continue to flow as it does now. This is a fairer and more democratic system without inhibiting the flow of the AGM unduly.

NZART Treasurer's Report

The Financial Result for the Year ended 31 December 2012 is a deficit of approximately $25,000. This result wasn't unexpected as the budget for the year was for a deficit of $25,295.

This is the first deficit since 1999 and there were a number of significant factors that contributed to this situation. These factors include;

- Representation at international IARU meetings (Overseas Travel)
- The distribution of *Call Book* in both printed and digital media versions. This had been deferred from the 2011 year as the information required on call-signs from the Ministry was not accurate enough.
- Falling membership.
- A membership drive that was delayed while the Ministry of Economic Development cleaned up the Radio Amateur Database (almost 4000 letters were sent out to amateurs that do not belong to this Association).

The areas of concern within the budget were not the problem areas in the final accounts eg

	Budget	*Actual*	*Bottom Line Effect*
Subscriptions	136,000	124,030	– 11,970
Interest Income	9,413	12,000	– 2,587
Break-In & *Call Book*	65,344	68,000	+ 2,656
Overseas Travel	15,700	25,000	+ 9,300
HQ Operating Costs	69,232	62,720	– 6,512

The result of the membership drive has been positive with over 240 members signing up. However the subscriptions due from these new members are income in the 2013 Financial Year. The initial subscription was also discounted to fifty percent of the normal subscription so it's important that we keep these new members long term.

In 2005 I gave a warning that a critical point for the Association would be when membership fell to around the 1800 paying membership level. There was nothing significant about the 2005 Year but there were some trends emerging that needed to be addressed for the long term good of the Association.

	2005	**2012**	**Bottom Line Effect**
Membership	2174	1865	
Subscription Income	$134,080	$124,030	– $ 10,050
Other Income	$ 11,500	$ 24,347	+ $ 12,847
Break-In	$ 57,210	$ 65,344	– $ 8,134
HQ Operating Costs	$ 52,233	$ 69,232	– $ 16,999
Taxation Expense	$ 4,673	$ 2,092	+ $ 2,581

At the Face to Face meeting held just recently this information was given to Council with recommendations to:

- Retain members –Make belonging to the Association attractive to Amateurs
- Attract new Members
- Maintain an early rebate for the prompt payment of Subscriptions
- Keep control of Costs
- Use volunteers where they can be effective in minimising costs

Once again your Association needs to focus its resources on what's important for the future of Amateur Radio in New Zealand and to look at ways of reducing costs to live within their means.

Evan T Sayer, Treasurer

NZART Conference 2013

Home of the Golden Shears
Queen's Birthday Weekend
(31 May to 2 June 2013)

The Wairarapa Amateur Radio Club Inc. Branch 46 invites NZART members and their partners to join us at the Copthorne Hotel and Resort Solway Park Wairarapa. It has been 10 years since we last hosted conference in Masterton so hope to see a few familiar faces over the weekend.

The Venue

The Copthorne is located at the southern end of Masterton on High Street. There is ample parking and plenty of facilities at the venue for those staying at the Copthorne which include indoor heated swimming pool, (and a outdoor pool for those hardy souls) 2 spa pools, squash court, Gym, Petanque, Tennis court, Volley ball, Pool table, and even a jogging track if you feel energetic plus there is a on site driving range with café. There is also free parking for campervans and now includes a 4 square supermarket on the premises as well as the Homestead restaurant adjacent to the main Copthorne complex. The main Masterton shopping area is located no more than 10 minutes away with other shopping including Pack n Save only 5 minutes away.

Registration

Registrations will take place from 3pm until 9pm on Friday evening 31 May in the foyer of the Copthorne. There is a bar close by with a chance to catch up with old friends. The registration desk will be open again at 8am on Saturday for those that miss registering on Friday night. The registration form is available in this *Break-In* on the adjacent page but please only one person per registration form. The registration form is also available as a download from our special conference web site at <www.nzartconference 2013.co.nz/downloads> if you don't want to cut up your *Break-In* or don't have access to a photocopier. Remember the cut off date for registrations is the 19 May 2013 otherwise a late registration fee of $40 will apply.

Entertainment

Our entertainment on Saturday night will consist of a local celebrity one man band who I am sure will entertain without loud music so you can still hear yourselves think. Having a back ground of being a butcher in his previous life and now runs a graphic design business as well as plenty of other involvement in the community, what he can't do with a ukulele or guitar is not worth doing. Sunday night will include our very own Jim Meachen, ZL2BHF and is world famous (at least in the previous NZART Conferences) for his quiz night. So bring along your thinking caps for a great night.

Provisional Programme Saturday

The Annual General Meeting will be opened by our local Mayor Gary Daniell followed by the official photo which can be ordered at the conference. After the AGM has concluded, the AREC AGM will follow then pre-dinner drinks and the main dinner.

Sunday

Sunday's programme will include the AGM's for WARO, OTC, SPAM, and AMSAT-ZL followed by forums on Regulatory Topics by Don Wallace ZL2TLL, Intruder watch by John Martin ZL1GWE, D-Star by Mark Gooding ZL2UFI, Contesting by Frank Hunt ZL2BR, APRS by Max Wheatley ZL2MAX and Writing articles for *Break-In* by Gary Bold ZL1AN. After the forums there will be pre-dinner drinks before the main meal.

Alternative Programme

Saturday morning after morning tea, the bus will take you into town and visit the Shear History and Aratoi with a chance to do some local shopping. The bus will return you to the Copthorne for lunch then back on the bus to the Stildholph toy museum then onto the Pointon Collection of Vintage Cars and Motorcycles, Costumes and Antiques returning to Copthorne for afternoon tea.

On Sunday after morning tea the bus will take you to Greytown for shopping including the Shoc choc shop for chocolate lovers then to the Greytown working mens club for lunch then back to Carterton to look around Paua World then arrive back at the Copthorne for afternoon tea.

Accommodation

There is a wide range of accommodation available at the Copthorne resort .Ring Copthorne Hotel on 0800 765 929 or email <reservations@solway.co.nz> and quote the group booking reference number 67866 for a flat rate for any room (standard and luxury)of $145 per night. There is also free parking available for campervans (non-powered site) at the location. There are also plenty of other hotels and motels no more than 10 minutes driving time from the venue to suit your budget.

Talk-in station

This will be running from Friday afternoon on 146.80MHz with the call-sign ZL2OA. Please use this call-sign if you require any directions or information regarding the conference and will see if we can help.

Questions

If you have any questions relating to conference, please don't hesitate to contact us at <info@nzartconference2013.co.nz> and we will see if we can help.

NZART Conference 2013 – Masterton

Home of the Golden Shears
Queen's Birthday Weekend
(31 May to 2 June 2013)

Please, one person only per registration form

Name: _____ Call-sign: _____

(If you have a nickname or preferred name, please note it here) (Or XYL / OM)

Address: _____

_____

_____

Special dietary requirements _____

Phone, cell: (____) _____ Phone, home: (____) _____

E-mail: _____

Entire Weekend	**(Please select only one)**		**Tick ✓**
Full Amateur program	Includes all refreshments, lunches and dinners	**$195**	
Full Alternative program	Includes all refreshments, lunches and dinners	**$195**	
	OR		
Saturday			
AGM only	Does not include refreshments or meals	**$0.00**	
Amateur program	With lunch & refreshments, but without dinner	**$50.00**	
Alternative program	With lunch & refreshments, but without dinner	**$50.00**	
Sunday			
Amateur program	With lunch & refreshments, but without dinner	**$50.00**	
Alternative program	With lunch & refreshments, but without dinner	**$50.00**	
Dinner		**$50.00**	
	Total $		

Please note: Registrations close on Sunday 19 May 2013.

ANY REGISTRATIONS RECEIVED AFTER THIS DATE WILL NOT BE PROCESSED, unless an additional $40 is added to the total above, to cover late-registration arrangements.

Please make your cheque payable to Branch 46 NZART Conference 2013 and post with your registration form(s) to PO Box 860, Masterton.
For those wishing to pay by bank deposit, bank account details are Westpac 03-0687-0331198-01. Remember to put your call-sign and/or name in the reference field so we know who has paid then email back your completed form(s) to registrations@nzartconference2013.co.nz

The Morseman

Gary Bold ZL1AN
<morseman@nzart.org.nz>

Low plate-voltage valves

"Of course", a sententious electronics student observed to me once, "the problem with tubes was that they required hundreds of volts." He was surprised when I told him about the simple, low-voltage valve radios which were familiar to my generation, constructed from components bought from firms such as *Lamphouse*®, in Wellington, or "*SOS Radio*"® in Auckland. These names may cause a nostalgic stirring of memories of bygone youth in the minds of older readers, for many of us, and our fathers, built them in the golden age of battery receiver construction.

The Hikers One

The schematic of such a radio is shown in Figure 1, the "Improved Hikers One", as published in the 1952 *Lamphouse Annual*. This was the most popular New Zealand radio kit of its time. I know this because *SOS Radio*, the legendary radio hobbyist shop in Queen Street, Auckland, couldn't keep up with the demand for the constructional kits they sold for it. I frequently visited this shop as a teenager with my father, who had been an enthusiastic builder of simple radios in the 1930's, and had soldered together a *Hikers' One* for me to listen to in bed. The main constructional difficulty was the coil. If not wound correctly, the result was a radio which didn't tune over the correct range, or in which the regeneration control was either too ineffective, or alternatively, was prone to bursting into uncontrollable oscillation. So the shop supplied standard, pre-wound coil assemblies with the kit. These were time-consuming to produce, and I was recruited to wind them as an after-school job. Figure 2 shows what the radio looked like when constructed.

What a wonderful job for a teenager fascinated by Physics and Electronics! I got to talk to the experts behind the counter, and listen to the kindly service-man explain how he was fixing the sick radios that flowed through the doors. In those days most of the faults were easily-diagnosed resistor, capacitor or tube failures. Replacing them was cheaper than buying a new radio.

I became probably the world's only specialist *Hikers' One* coil winder. Using a hand-cranked winding machine, with turns-counter, I could turn out a standard, three-winding coil every three minutes or so. The job lasted for a year, and in that time my outstanding work ethic eliminated the supply bottleneck and got far ahead of demand, eventually filling a circular bin about 75 cm diameter and the same height with beautifully wound coils; hundreds of them. What happened to them? I can't imagine that they ever all got used.

How did it work?

The circuit was a classic, regenerative "grid leak detector", with slight negative bias formed by *DC* grid current through the *1MΩ* resistor, the *RF* signal bypassing this through the capacitor. The "tickler coil" provided positive feedback, adjusted by the *500kΩ* variable resistor, sometimes called the "throttle control". For AM reception, this was adjusted to just below the oscillation threshold to enhance sensitivity and selectivity. Well, that was the idea. In practice this adjustment was quite critical, and the onset of oscillation usually sudden. In the original circuit, the accelerating grid was connected to the +9V supply, but most later versions reduced this to +1.5V as shown here in an attempt to tame it, and some had the feedback potentiometer connected to the accelerating grid instead.

What is this "accelerating grid"?. The schematic shown in figure 1 seems obviously wrong. Surely the two grids should have their connections interchanged? The grid to which the signal is applied is normally the one nearest the cathode, and the other, the "screen" grid, is the one which should have the positive, accelerating voltage applied. But no, this is correct, that's the way it was designed, because the tube originally used operated in "space charge" mode, and the outer grid is *not* a

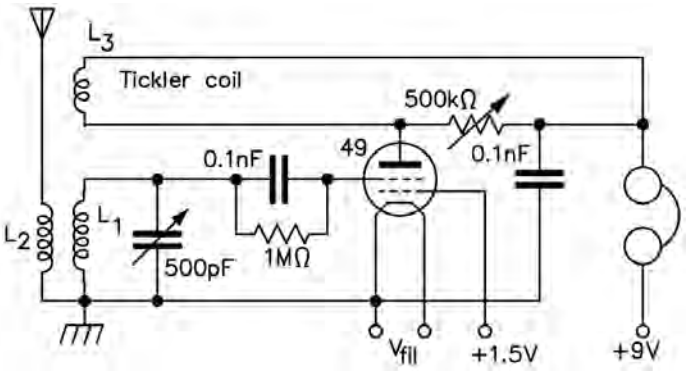

Figure 1. Circuit of the 1952 Lamphouse "improved Hikers' One".

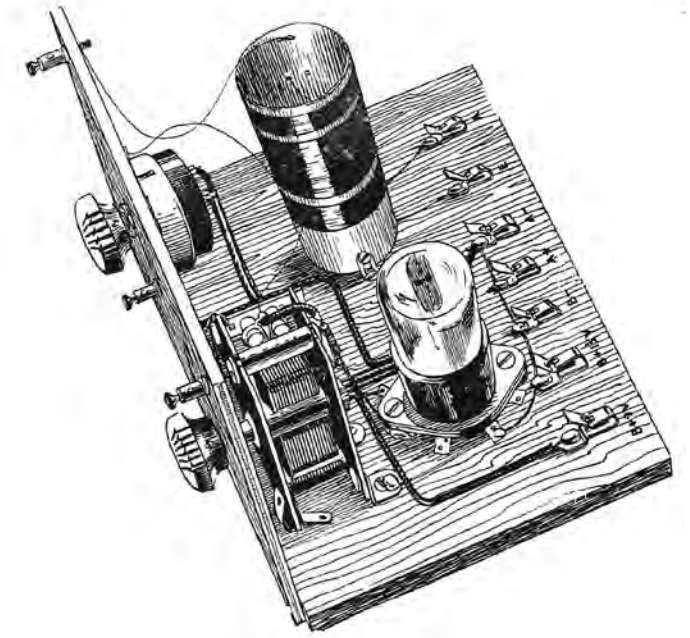

Figure 2. The suggested Hikers' One circuit layout.

"screen grid", but the "control grid".

This, in fact, was the configuration used for the earliest tetrodes, proposed by Irving Langmuir in his patent application of October 1913. Langmuir was addressing the problem of the electron cloud boiled off by the filament, which, by its negative charge, once formed, inhibited further electron flow to the plate. His solution was to insert a positively biased grid between the control grid and filament to partially neutralise the electron cloud's repelling effect and enable higher plate current to be obtained at lower plate voltages. This was called a "space-charge" grid, and the idea worked admirably. This is the reason that the *Hikers' One* grids are connected the way they're shown, and why the original circuit worked best with one of these old tubes designed for the purpose.

Only later, in 1916, did Ando, a Japanese engineer, realise that using the inner grid as the control grid would enable the outer grid to be grounded for signal frequencies and thus form an electrostatic "screen", reducing the inter-electrode capacitance between filament and plate. This greatly reduced the Miller effect that had up to that time inhibited higher-frequency operation, and which was becoming a much more significant problem. This "screen-grid" tetrode design is the only one that has survived, the "space-charge mode" ones having all perished. The 49 tube was one of this family of now-extinct tubes, which also became known as "bi-grids", because *both* grids, wound with relatively coarse pitch, *were* effectively "control grids".

In 1942 *Lamphouse*® produced kits (costing 55/-) for a short-wave version, with instructions for winding 3 plug-in coils, which between them tuned from 200 kHz to 17 MHz.

This was only one of many one-tube regenerative receivers that keen experimenters built in those days, all with very similar circuits. Without the cacophony that fluorescent lights, switched-mode power supplies, lamp dimmers and other electronic devices now generate, the RF spectrum was very quiet, and these simple radios

performed astonishingly well.

In 1952, *Lamphouse* published the *Octal Hikers Two*[2], which used 1Q5GT tubes, and since this was not a space-charge tube, the grids were connected as is now considered normal.

History of the Hikers' One

John KB7NRN says that the first practical receiver utilising the space-charge mode was built by Ray Usher VE4EA, and published in the October 1935 issue of *QST*. Ray used a 49 tube regenerative detector, followed by a 30 tube as audio amplifier. In 1936, *Popular Mechanics* borrowed Ray's idea, and published an article describing a single tube receiver also using type 49 powered from flashlight batteries. In 1937, *Lamphouse New Zealand* copied the Popular Mechanics circuit again, and sold kitsets, re-titling it the Hiker's one. Next year, they followed with the *Hikers' Two*, which reproduced Ray's original design with a following audio stage, which could drive a loudspeaker. The *Peebles Originals* site[1] reproduces scans showing the evolution of the circuit through the years.

Because it was used in the original design, the type 49 continued to be specified, though it was becoming obsolescent even at the time the *Hikers' One* was introduced. Other types would work, but tubes were expensive[3], [4]. In 1952 the 49 cost 17/-, or in modern terms $1.70, which doesn't seem too bad, but applying the official Reserve Bank inflation index factor of 47, from 1952 to 2012, this equates to about $40 in today's money! It is no wonder that early experimenters like my Father cherished their valves!

An aside: In 1963, 10/- bought my Standard Vanguard 2.75 gallons of petrol. This converts to 12.5c/litre. The inflation multiplier from 1963 to 2013 is 39. This gives a current inflation-adjusted price of $4.88/litre, over twice what I paid yesterday to fill my Mazda 6. But the Mazda, on a trip, consumes about 7.5 litres/100 km, about half of what the Vanguard gobbled. I'm paying only a quarter as much for fuel as I did when a student. Food for thought.

The Hikers' One as a Transmitter

If the feedback was adjusted to just before the onset of oscillation, the circuit became very sensitive and frequency selective. With the short-wave coils, I could hear overseas broadcast stations, and also some interesting people called "*Hams*" around New Zealand who not only talked to each other with their voices, but also apparently communicated somehow using mysterious thumps. I discovered that these signals became musical tweets when I listened with the regeneration set just above the oscillation point, and found that I was listening to Morse code.

I soon found out that my *Hikers' One* also radiated when oscillating, and I could hear its signal on the lounge radio. A friendly radio serviceman showed me how to make this radio's IF stage also oscillate by soldering a short wire to the grid cap and poking it judiciously down inside the valve shield. Now I had a transmitter and receiver with BFO! I connected a Morse key in series with the *Hikers' One* headphones, and attempted to interest my parents and sisters in learning Morse so that they could receive messages from me. But this was a total failure, as even my kindly Father refused to contemplate memorising the code.

The Reflex Principle

Since tubes in my Father's time were expensive, designers displayed considerable ingenuity in using as few as possible. "Reflex" circuits were published which used one tube simultaneously as both an RF and audio amplifier, and the *Peebles* site reproduces one of them which used a 1D8GT tube[5]. My Father built a portable version of this design, which worked magnificently. I recall our family sitting on the beach listening to it one Sunday afternoon in the late 1940's, when portable radios were such a novelty that about 50 other people gathered round to listen, and marvel.

The 1D8GT was a 1.4V filament tube, and contained diode, triode and pentode units in a single envelope. The triode was used for both RF and audio amplification, with the pentode acting as a power amplifier. This gave surprising volume on local broadcast stations. It's difficult to figure out from the schematic how it works, so figure 3 shows a simplified version of the reflex portion of the circuit, in this case just driving headphones.

The signal from the antenna is tuned in RF transformer T_1 by capacitor C_t and applied to the grid. The bottom end of C_t is effectively grounded for RF by the 1 nF capacitor C_b. The amplified signal at the plate is passed to a crystal diode rectifier through broad-band *RF* transformer T_2, and envelope-detected to extract the audio signal. This passes through T_3, an audio transformer, and is applied again to the grid through the secondary of transformer T_1, which has low impedance at audio frequencies. Capacitor C_b has a reactance of about 30kΩ at audio frequencies, so has little attenuating effect. The plate winding of T_2 has low impedance at audio frequencies, so most of the amplified audio signal appears across the headphones. In my Father's portable radio, the 'phones were replaced by an output stage using the pentode section of the 1D8GT. With inflation, this tube's cost was equivalent to $47 today, so we cherished it.

Last Month's Problem

"Why does old-time DOS executable file start with the two ASCII characters "MZ". What is the significance of this?"

These are the initials of Mark Zbikowski, the Microsoft computer engineer who designed the DOS format. It specifies that the following code should be executed as an "EXE" file, and not a "COM" file, the original format inherited from the CP/M operating system, and which was just a memory image of the machine language code. If interpreted incorrectly as machine code, "MZ" translates (in *Intel* syntax) as "dec bp; pop dx", which gives an unpredictable result. No programmer would start his code with this, so its inclusion gave an unambiguous indication of an EXE file. And, incidentally, of immortalizing the developer's name.

I learned of this from a *BYTE* article many years ago, but nobody remembers it now. However the internet readily reveals it, and Phil ZL3PAH, Dave ZL1AFQ and Ron ZL1AI unearthed it. Ron further told me that he embedded "RGB",

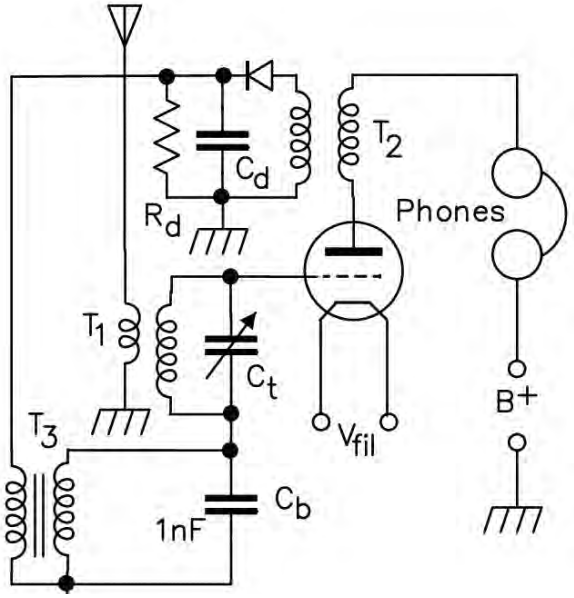

Figure 3. Simplified circuit of combined RF/IF stage of reflex receiver.

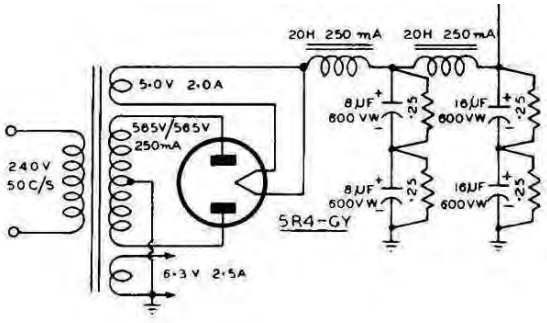

Figure 4. A directly heated valve rectifier circuit.

continued on page 32

SPAM – Society For The Preservation Of Amplitude Modulation

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Phone: 07-855-5435

Greetings to all. This month there is a contribution from Jim ZL1AVR. Jim is a retired accountant who has retired to Thames and in a previous life he was employed by the NZ Post Office. He writes about an incident which occurred around Christmas time in 1953. Herewith his story:

Tangiwai

It was the 24th December 1953 when the restless mountain shook its fist at the little people who clambered up and down its slopes and peered into the milky depths of the steaming Crater Lake at the summit. That evening, the fiery core of Mount Ruapehu heated the sulphurous water forming the lake, pushing it higher in the mouth of the mountain until it broke through the crater and undermined the Whangaehu glacier on its eastern slope.

The foundations of the glacier melted and it slid with ever increasing speed down the steep slopes of the mountain and followed the course of the valley, heading south, then west. Many acres of immature pine trees were cut off at ground level by the swift passage of ice and sulphurous water from the Crater Lake. Man-made bridges were no barrier to the rampaging ice and water as it streamed down the slopes. A large concrete span supporting the main trunk railway line was swept aside and a wooden road bridge joined the wall of rubble at the head of the lahar.

That same evening, 285 travelers were enjoying their passage on the NZR express train from Wellington to Auckland and were looking forward to spending Christmas day with friends and family. The train reached the Whangaehui bridge at Tangiwai 10 km north of Waiouru just as the lahar passed. Despite a warning from a man standing near the tracks waving a torch, the train was not able to stop and careered on over the damaged bridge.

The engine, it's tender and 11 carriages swept on. The rails were intact at this time, but without the missing pier to hold them in place, the engine, tender and the first carriage broke through, struck one of the remaining piers and landed in a tangled heap on a huge block of ice on the far side of the river. The next four carriages, propelled by their own momentum, fell into the sulphurous torrent. The leading first class carriage was sixth and hung suspended over the broken tracks for a few minutes until the coupling snapped and it too plunged into the depths. One of the carriages and many of the passengers were washed eight km or more down the swollen Whangaehu river. Survivors struggled through the torrent of water or were assisted to the shore. Many lives were lost either from the impact or from drowning in the river.

Rescue workers rushed to the site from the Waiouru army camp to the South and from Ohakune to the North. One hundred and fifty-one people lost their lives. It was amazing that one hundred and thirty four people survived. There were many acts of heroism in the rescue of the survivors.

There was only one telegraphist in the area at that time. He was just 18 years of age and worked continuously at the Ohakune Post Office for 15 hours sending telegrams from survivors to relatives all around the country directly to the Auckland Telegraph Office and sent press reports sending the terrible news to the various newspapers. Eventually he was relieved by two teleprinters and operators from Palmerston North.

He saw bodies being unloaded from local trucks and vans, he met survivors from the train searching for missing families or friends. He worked alongside the Queen's Secretary who was typing reports without pause. He met the Prime Minister, Sydney Holland who had driven down overnight from Auckland and worked tirelessly, coordinating rescue activities at the site. It was a traumatic occasion for all involved. Much sleep was lost in the nights that followed.

How do I know all this? I was that telegraphist.

Jim ZL1AVR

I make no apologies for adding a second contribution from Jim this month as I think this quite relevant and I have a vital interest in AREC, being an "Area Manager" for the National Director (although perhaps I may be stepping on the AREC column's toes here):

Amateur Radio

Obtaining our Radio Operator's Certificate and practicing our hobby not is not only a privilege and a pleasure, but also shapes our lives and develops a special type of character. By taking an active part in our hobby and our organisation, we learn new skills and become a useful part of our community. As a member of AREC, we experience unique opportunities to help people in distress and to support the Emergency Organisations who come to their aid.

The rewards are few. There is the satisfaction of preserving the safety and security of the people we work with. There is the gratitude of the people rescued and their families shared by the whole team. We have the satisfaction of being a part of a well-trained team and knowing that we have contributed to the training of that team.

Our efforts are not well-publicised. Because we are not permitted to talk to the Press, they ignore us. The nature of the messages we handle requires us to maintain strict secrecy and confidentiality. The work we do may be very interesting to other people, but the content of messages handled must be kept to ourselves.

To avoid disappointment, we can forget any chance of payment or publicity. A successful operation is its own reward; the satisfaction of a job well done! A life saved, discomfort eased, or a family relieved of worry. That is the only reward our teams can expect.

I have participated in many rescues and emergencies, on land, sea and in the air, but I will not embarrass those people by telling their stories. I will concentrate on keeping myself and my equipment ready for any future opportunities to use my hobby to help others.

Thanks to all those fellow hams who have helped in my training and encouraged me to be of some use in the community.

Jim ZL1AVR/ZK1EI

Well, that's it for this month. The cupboard is now bare! There are a million stories out there. There are heaps of articles that would be of interest to people who, like me, have an interest in "AM" telephony.

We will see what the mailman bringeth!

Bill ZL4AE

◂ *continued from page 31*

his initials, in an 8085 operating system that he wrote, and is thus similarly immortal.

This Month's Problem

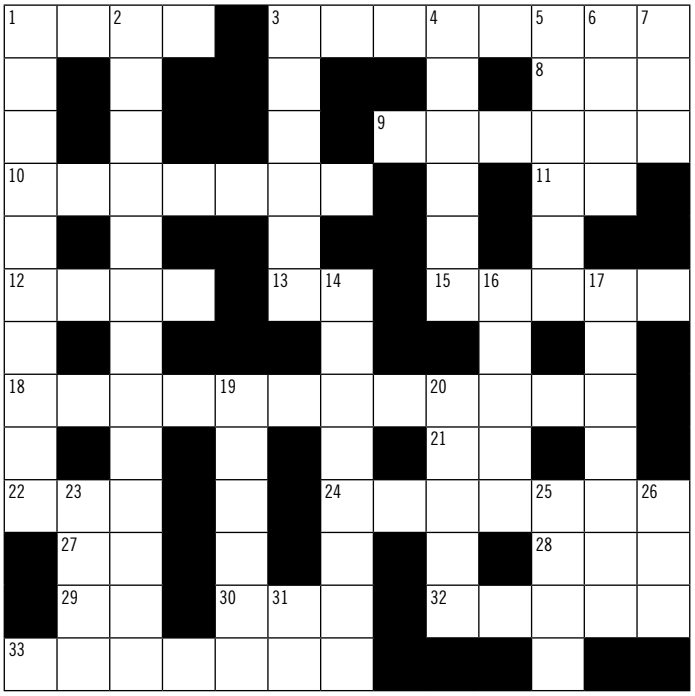
Figure 4 shows an old schematic of a tube full-wave rectifier circuit. Why was 6.3 V chosen as the filament voltage for the tubes it powers? These tubes would all have been "indirectly heated" (with cathode separate from the heater), but the rectifier tube has a 5V filament, and is "directly heated" with no separate cathode. Why was 5V used instead of 6.3V, and why was it directly heated?

References

[1] History of Hikers' One <http://www.peeblesoriginals.com/projects/hikers-radio.php>
[2] Photos of Hikers Two <http://www.antiqueradios.com/forums/viewtopic.php?t=71753>
[3] Vaccum tube theory <http://www.john-a-harper.com/tubes201/>
[4] Summary of tube operation <http://mysite.du.edu/~etuttle/electron/elect27.htm>
[5] Reflex receiver <http://www.peeblesoriginals.com/radioarticles/index.php>

ZL Crossword No.21

Compiled by Graeme Hunt ZL1ANH



Across:

1. An army vehicle in the transmitter final (4)
3. Negative or positive (8)
8. Female cervidae (3)
9. Computers from the Job (6)
10. Lots in ZL with gates and drains (7)
11. Sardinian prefix, verb singular present tense of be (2)
12. Women don't actually have more than men (4)
13. Ancient SU sun god (2)
15. Grey colour on resistors (5)
18. _____ _____ incidence antenna (4, 8)
21. Greek alphabet, 13th letter (2)
22. Costs more than the printer (3)
24. Arithmetic mean (7)
27. Visit Vienna on your big overseas travel, prefix (2)
28. Do you know any Scots (3)
29. Abbreviation of honoured academic title (2)
30. Naturally occurring mineral (3)
32. Geminis, astrologically speaking (5)
33. 7Z and JT and 5T have large ones (7)

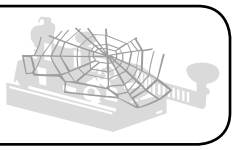
Down:

1. You can get to _____, going north, or going south. From a song by Peter Capes (10)
2. They may reduce QRN (5,8)
3. Weak signal HF digital mode (6)
4. One volt across one ohm, equals one _____ (6)
5. Ticking over (6)
6. Phalanges (4)
7. Affirmative (3)
14. Where you'll find the hams on (8)
16. Bring upon oneself (5)
17. Type of incandescent lamp (7)
19. Phonetic alphabet, morse is •••– (6)
20. Another name for noble gases (5)
23. Where amplitude of standing wave is minimum or maximum (4)
25. Like, similar to (4)
26. Units of printing measurement (3)
31. Radio Telephony (2)

Answers on p36.

Silent Keys

The Association deeply regrets to record the death of the following members and extends its sympathy to the bereaved.



Silent Keys: guidelines to contributors

Contributors are requested to limit their obituaries to between 200-400 words. Content should focus mainly on the amateur radio activities of the deceased. Normally photographs cannot be included.

David Roy Symon (Roy) ZL2KH
2 Dec 1938 – 10 Jan 2013

Pharmacy was Roy's profession, Ham Radio was his delight. He owned his own business for 21 years until 1986, then served as a locum pharmacist until 2003. He was a truly remarkable man, very intelligent and with an astonishing memory. Totally unpretentious, he was just himself at all times. Formidable intellect and memory, high-speed thought processing and razor-sharp wit – made him always stimulating company, well known for adding sparkle to the dullest of meetings. He liked a good debate, while his jokes and his care for the community are both legendary.

First licensed in 1965 as ZL2TFF, Roy passed the Morse Code test in 1989 and became ZL2KH. His interest in all things amateur radio was a huge part of his life and he made lifelong friendships with many fellow hams. A Life Member of Branch 27, Secretary or President many times, he was also an NZART Councilor for 6 years and National President for about 3 years until his health deteriorated. He stepped down to spend more time with his much loved family and his hobby for what it was ' A HOBBY.' Typically, he did warn that at his funeral if anything funny or untrue was said, a gadget in his coffin would either laugh or yell an obscenity!

Roy was a people person and very philosophical, which is why he was loved and respected by many amateur radio enthusiasts, CD personnel, SAR and Police. He knew how to say the right things to get something done, and wasn't afraid to roll up his sleeves and do it himself. He was very supportive of any actions that would ensure amateur radio status in the future; extremely passionate about his hobby and where it fitted in the larger scheme of life.

Roy had numerous radio-associated interests and demands on his life, working with the police to keep their radios operational, many search and rescue operations he attended and loved, the groups he ran for amateur radio and the columns he wrote for *Break-In*, to name a few.

In 2009 Roy's community service was officially recognised with a long-service award from Civil Defence for 42 years of voluntary work. His knowledge of their systems and those of the Police was vast, and his willingness to help out in any capacity will be so sorely missed.

Sincere condolences to Jill and their family.

Compiled by Malcolm Potts ZL2MRE, from funeral tributes

Paul Bruce Newland ZL2TVV

Paul Bruce Newland of Tawa., who was very active in SAR died at the Cashmere Home in Johnsonville on Tuesday 14th August 2012 aged 67 surrounded by his loving family.

Reported by Neil John McDonald NZART No. 104 637

Pat Hawker MBE, G3VA

Radio amateurs around the world will be saddened to learn of the death of Pat Hawker MBE, G3VA, on 21 February 2013. He was 90 years old. Pat was first licensed in 1936 as 2BUH, becoming G3VA in 1938. Amateur radio has lost one of its legends. My "Technical Forum" column of a few years ago was inspired by Pat's "Technical Topics" column in RSGB's RadCom.

John Walker ZL3IB

Old Timers' Club

Stephen Hayman ZL1TPH
<zl1tph@nzart.org.nz>

From the desk of the "Grand Old Man"

Greetings. Firstly it was very sad to learn of the passing of Roy Symon ZL2KH, it was indeed a privilege to be asked to speak at his funeral service in New Plymouth on Wednesday 16 January, there were a lot of "Hams" present from far and wide. Roy will be sadly missed for his advice and knowledge.

It is also sad to report that Ian Ogier ZL1AF passed away recently; Ian was always on the OTC net on Monday evenings. I had visited him while he was in hospital, we all thought he was getting better, but this was not to be.

On a more pleasant note, I would like to express thanks to John Poulsen ZL2TCA for taking over the job of sending out reminder emails concerning the Monday OTC net... Thanks John. I am very pleased with the smooth transition of our new Officers namely Barry ZL2RR (Secretary) and our new Scribe for *Break-In* Stephen ZL1TPH, thanks you two for volunteering your time to The Old Timers Club ZL.

I would like to see a great muster of OTC members at the annual Conference in June which will be held in Masterton.

To conclude this short report I would like to share with you all some words which I used at the conclusion of Roy Symons eulogy.

ZL2KH

Your skills in Radio have now ended, with many folk that you befriended,

Roy, as ZL2KH will not now be heard, may his soul be as free as a bird,

Your Morse Key won't click again, likewise your electric Train,

The Lord has called you to your home to be, on earth we register you as a Silent Key

Until next time I wish you all good health and many DX

73, *Ivan Horn ZL2ATU*
Grand Old Man OTC (ZL)

Annual General Meeting

The Annual General Meeting of the Old Timers' Club (ZL) will be held on the Sunday morning of Queen's Birthday weekend (2 June 2013) at the NZART Conference in Masterton. The business to be conducted will include the election of officers and other usual AGM matters.

If you are unable to attend and would like to nominate anyone please send your nomination to me. Nominations will need to be seconded, and the permission of the person being nominated will also be necessary.

The recipient of the Montgomery Cup for the best article in *Break-In* by an OTC member in the preceding year will also be decided.

There will also be time for the discussing of all sorts of matters that you might like to initiate.

73, *Barry Stewart ZL2RR*

Montgomery Cup

Nominations for the best article in *Break-In* by an OTC member in the preceding year to be in the hands of the Secretary by 30 of April 2013, Thank you.

Old Timers' Club-OTC (ZL)

- To recognise service to Amateur Radio;
- To revive and maintain interests and good fellowship among the older members in the common cause;
- To offer advice and encouragement to newer Amateurs;
- The Club is affiliated to the New Zealand Association of Radio Transmitters (Inc.)

Grand Old Man
Ivan Horn ZL2ATU.
P.O. Box 7250 Wanganui
E-Mail <loobie@kol.co.nz>

Secretary/Treasurer
Barry Stewart ZL2RR
1 Caversham Road,
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Phone: 06 345 4152

Monday Evening SSB Net
Net details: 2030 hr (local time) each Monday on 3.870 MHz LSB.

Sunday morning AM Net
Net details: Sunday morning at 10.30 am on 3.850 MHz.

SSB Net Controllers
Don Dalrymple ZL3SZ
Stuart Watchman ZL2TW
Pete Moore ZL2AUB
Ivan Horn ZL2ATU

AM Net Controller
Doug Alexander ZL2AWF

District Representatives
ZL1: Stephen Miller ZL1FS
ZL2: Stuart Watchman ZL2TW
ZL3: Don Dalrymple ZL3SZ
ZL4: Peter Anderson ZL1LR

New Membership

OTC encourages new members and the only requirement is that you must have held a Ham Licence for 25 years. Application forms are available from the Secretary, Barry Stewart ZL2RR (Call Book Address) and a one off fee of $10 applies.

New Members

There is one new member to welcome this month:

1288, ZL2MM, Mike Dwyer, Wellington

Silent Keys

Sadly we farewell the following members:

#791, ZL1AF, Ian Ogier, Palmerston North

#854, ZL2KH, Roy Symon, New Plymouth

Our sympathy is extended to all their families and friends.

849, Mr Rod Greene ZL2ACE (Silent Key: March 2012)

Rod, born and raised in Napier, first undertook an electrical apprenticeship but, 15 months into this five year contract, his employer got 'tardy' with the hourly rate and the Labour Department became involved. "Pay up or find another employer to take over Rod's apprenticeship" was the word from this august body. Rod himself overcame this impasse by approaching Columbus Radio, located further down the street, and got himself signed up for an apprenticeship with this well-known firm.

During this time in Napier, Rod sat and passed the Amateur Radio Theory paper but did not complete the package of passing the CW section within the required 12 month period (No 'T' calls back in those days!) Part of the reason for this was that Columbus transferred Rod to Wellington where, in 1952, he completed his apprenticeship. During 1950 he undertook his CMT. (For the younger reader, this was in the days when the male youth of the country had to serve a period undertaking 'Compulsory Military Training.')

Rod married in 1951 and in September of that year resat the 'Ham' exam, undertook the 1st class CRT examination and in the November wrapped up his Ham Ticket by passing the CW test. George ZL2AFZ, the CW guru for many of the early years in ZL gets credit for this CW effort from 'our man of the moment.' September 10 1956 saw Rod semi-complete with his HF permit after passing his 'on air' 15 wpm CW and frequency measuring tests.

These on-air tests were carried out by the late Dan Wilkinson ZL2AB and were some of the last to be so done. After the successful completion of this phase, a further twelve months of operating had to take place before the local Radio Inspector called and carried out a shack inspection. With the RI satisfied, Rod was then issued with a 20 metre phone permit on 10 September 1957. ((Not too much later after Rod obtained these HF permits, this system of qualifying for such privilege permits was done away with.)

Rod's first on air QSO was at 2304 on Thursday 9 November 1951 with ZL2AOC, Alex Hamilton, who worked behind the counter at Turnbull Jones. Overtime on the 8th precluded him from getting on air when his certificate was issued.

ZL2ACE's rig was a two-time converted ZC1 Mk2. This rig had had a marine conversion and was off his ex-father-in-law's boat. Rod rebuilt the rig and incorporated a mains supply. A mixture of CW and AM phone QSOs only are listed in the old logs until an entry made on the 27 June 1958 when he had an SSB QSO with Cliff Reed, ZL2AHV later ZL1BR & K6DO. Rod was involved with Cliff Reed, Lester Earnshaw, ZL1AAX, Dennis Cobbe, ZL1ND and Les Himing ZL3BG; and this group drove the development of phasing SSB in this country. (Des Wright also produced phasing rigs around this period.)

In 1952 Rod topped New Zealand for the Radio Serviceman's' Examination. From 1953 through until the

end of 1956, Rod was employed by Civil Aviation when he returned to work for Associated Radio until he became the home-call Mr. Fix-it "Putting it Right" for LV Martin. During 1959 he left LV Martin's and started up his own business trading as 'Ngaio Electronics.'

ZL2ACE was active right through this period and on his Ngaio ½ acre he had switchable V-beams and quads, amongst others. Besides HF, 6 and 2 m (along with 460 MHz) capability had been added to the line-up in 1954.

The highlight for Rod during this time was the provision of a 2 m/ 20 m link from the Wellington Winter Show through which the Wellington mayor Frank Kitts spoke direct to Sir Edmund Hillary down in the Antarctica.

During Rod's time as a member of Branch 50 NZART, Wellington, he was Treasurer for the 1954 National Conference and in 1960, the Secretary of the National Conference Committee. From 1955 thru to 1962 he filled the position of Secretary of the Communications Committee (AREC).

Around 1964/65 Rod was a member of the ZL2PZ group that obtained a permit to run up to two kilowatts for the purpose of carrying out moon bounce experiments. This group included (amongst others) Gordon Huckin, ZL2AQU, Cliff Reed, Neville Roberts ZL2ANR and Noel Mullis ZL3QC.

In the mid-sixties Rod started collecting Collins equipment and during 2001 he sold most of this off to another good 'home' to ensure it will carry on being treasured in the future.

In late 1975 he shifted from Ngaio to Newlands from where over the next few years he conducted regular 2 m SSB simplex contacts with Bob Holt ZL1BBZ way up the country in Waiuku.

1962 saw Rod take up employment as assistant manager and specialist in valves, semi-conductors and test equipment for Odlin Agencies. He was promoted to Manager in 1970, retaining that position until 1984.

When the 1984 takeover of Odlins by Winstones (which on purchase set about dismantling the firm) was imminent, Rod took early retirement. He then setup his own business, Rojen Distributors, wholesaling components and whilst en-route on his sales trips, visiting ham shacks!

During many of these years Rod's equipment consisted mainly of home-brew or seriously modified commercial offerings. Rod kept himself busy designing and building equipment and HF and VHF antennas as well as maintaining his shack's equipment. He also took time out to 'Elmer' a few of the locals. He embraced PSK 31 and Slow Scan Television but still found time to operate genuine AM as well.

Drake line as well as an Icom 751 made up some of the operating equipment in the Aranui Street shack whilst a TH5 and a 6 element RAI Beam developed by Rod, with advice from WA7RAI, graced the skyline.

To celebrate his 70th birthday in February 2002 as well as 50 years a licensed amateur (8 November 2001) Rod announced to the February Branch 48 meeting that to celebrate these auspicious milestones, he would make a donation of batteries to back-up the proposed Wanganui Branch 'National System' link. These batteries are made by the Century Yuasa Company and appear to be a custom item. There are three batteries, each of two cells which when fully charged to 2.23 volts have a discharge rating of 550 Ampere hours. That is correct; five hundred and fifty ampere hours or about ten times the capacity of the average car battery! The three batteries in series give 13.38 volts at full charge. Each battery of 2 cells weighs 74 kg and is provided with lifting handles and straps and stainless steel nuts and bolts for inter-connection. A high current flexible cable is also provided for ease of setting up in a 3+3 configuration with minimum cable lengths.

Rod was issued with his OTC 60 year certificate acknowledging his sixty years as a licenced amateur radio operator (8 November 1951 – 8 November 2011) just prior to Christmas 2011 and celebrated his eightieth birthday on 15 February last year.

Unfortunately Rod's health had been in decline with several hospital visits over the last few months or so. Jennifer and Rod, who married in 1976, shifted to their Wanganui QTH in 1989.

Satellite Orbits

Andrew Barron ZL3DW
<ad.barron@xtra.co.nz>

Good news! TURKSAT-3USAT, a three unit amateur radio CubeSat developed to provide amateur radio SSB/CW communications in a 680 km Low Earth Orbit (LEO), is expected to be launched from China in May. TAMSAT, the Turkish Amateur Satellite Technologies Organisation, has produced a V/U linear transponder with an input of 145.940-145.990 and an output of 435.200-435.250 MHz and there will be a CW beacon on 437.225 MHz. Receive sensitivity is -120 dBm with a system gain of 150 dB, therefore the transmit power is +30 dBm (1Watt). The 2 m receiver has two 1/8 wavelength monopole antennas and the 70 cm transmitter has two ¼ wavelength monopole antennas. The two digital telemetry and control modems have 2 antennas each and the beacon has two, making a total of 10 antennas on the satellite. TURKSAT-3USAT contains two on-board computers; two electric power systems, and two beacons and modems. Both batteries and super capacitors are employed to store energy. A de-orbiting system is also developed to de-orbit the satellite following its end of life to comply with the current CubeSat standard and United Nations regulations.

The UKube-1 CubeSat is scheduled for a launch in June 2013. It will carry a U/V mode 435/145 MHz linear amateur radio transponder and a 1200 bps BPSK beacon for educational outreach. The spacecraft is being built for the UK Space Agency (UKSA) by Clyde Space and the launch will take place from Baikonur in Kazakhstan on a Soyuz-2-1b.

Ecuador is hoping to have two CubeSats in orbit this year. Their first CubeSat NEE-01 Pegasus will carry a 720p HD camera to send live video from space using a 3 watt TV transmitter in the 915 MHz (33cm) band along with a beacon that will send a Morse Code ID, a SSTV image and Ecuador's national anthem. It was originally planned to launch on a Dnepr from Yansy but is now expected to fly on a CZ-2D rocket from the Jiuquan Space Center in the second quarter of 2013. Ecuador's second CubeSat NEE-02 Krysaor carries the same payloads in the 915 MHz band as NEE-1 Pegasus but has a slightly different solar panel configuration. The 915MHz band is not a ham band in New Zealand, but of course anyone can receive the video images.

An American satellite, abandoned in 1967 as a piece of space junk has begun transmitting again after 46 years. An amateur radio astronomer in North Cornwall accidentally picked up the signal and after

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Monday evening on air OTC net

The ZL6OTC "On Air" net details are 2030 hr (local time) each Monday evening on 3.870 MHz LSB and all are welcome to check-in and say hello.

Acknowledgements

Many thanks go to the contributors who help make this column happen with their input: ZL2ATU, ZL2RR, and many others.

Summary

The OTC column in *Break-In* is a forum for members to publish a letter, or an article. OTC readers, along with association members, will all enjoy reading and hearing about other radio amateurs experiences, both past and current.

Contributions can be technical, an account of first involvement with early amateur radio, nostalgia, along with vintage radio which all provides an invaluable source of information on the history of their hobby.

The "Old Timers' Club" was essentially a social organisation, and that is still current today.

Articles relating to all aspects of OTC, are most welcome, and to be addressed to: Stephen Hayman, ZL1TPH; Postal address, 68 Kath Hopper Drive, Orewa, 0931 or via email to <zl1tph@nzart.org.nz> We also accept large picture files sent via email and will transcribe hand written letters to text.

73, *Stephen ZL1TPH*

Gettering / Conditioning tubes (valves)

by Tony Buckland ZL3HAM

Just recently I had an Alpha 91b linear amp on the bench (a big powerful beast) that had a blown screen supply circuit. I had to replace several faulty components, some of which I upgraded on the recommendation of Alpha, and then set up the various control voltages. Once I was satisfied all was as it should be it was time to push through some RF starting at a low level and gradually increasing input power until 1500 W was achieved, this was around 50 W.

Russian GU74b's (4CX800A) tubes.

Although the amp now performed pretty much as it should do the owner suggested we obtain a new pair of GU74b's (4CX800A) tubes from Russia; these were NOS (new old stock) military tubes, as the original tubes might have suffered a bit of trauma when the amp failed. After about three weeks they duly arrived still sealed in their original plastic bags and sealed cardboard boxes as left from the factory. Although these were brand new they had been stored for a long time (they don't manufacture them anymore, but may restart in the future) they had to be "conditioned" first. I just had the heaters powered on for 24 hours with no other voltages applied to the tubes. The quote below explains the reasoning as to why it's vitally important to do this before putting them into normal use.

Before using transmission tubes after a long storage period, the tubes must be conditioned. This process is called "Gettering". Andrey, AE1S explains on his blog:

"There is no such thing as a perfect seal! Vacuum tubes (especially high-power transmitting tubes) not used for a few years might exhibit serious problems if put into service without a prior conditioning of the vacuum. With time, gas molecules leak inside or are released by the tube's internal components. With years and years of storage, the vacuum could deteriorate and once the tube is used for the first time it could "flash-over"; the gas molecules inside will become ionized by the electron flow and this will create a flash of high-temperature plasma between the cathode and anode, damaging the grid(s) and other internal components. A chemical composition, called "getter" is factory deposited inside the tube to maintain the quality of the vacuum; this is the shiny, metallic area on the inside wall of the glass envelope (in smaller tubes). In power tubes, the activation of the getter is done by heat. Therefore, it is recommended, before putting into service a power tube with very long on-the-shelf life (more than a couple of years) to condition the vacuum first. This is done by applying power to the filament (cathode heater) only and leaving it on for a period of time. The hot filament will heat up the getter and also will improve the vacuum by itself (some gases will react with the hot tungsten filament and the cathode surface)."

Wikipedia also has an entry about the 'Getter' of tubes. This is no hocus-pocus, it is absolutely crucial to getter the tube/s before applying HV and power.

After the 24 hours I switched the amp off and reconnected all the connectors switched on and again proceeded to apply RF from a low level up until I got the full 1500 W, this time this was achieved at around 40 W so a slight increase in performance over the original tubes.

A successful outcome that highlights the necessity of "gettering / conditioning" tubes that have not been used for a long time to ensure they perform correctly and not fail prematurely. βi

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cross checking with various lists, has identified it as LES1 built by the Massachusetts Institute of Technology and launched in 1965. The satellite failed to reach its intended orbit owing to a wiring error and has been drifting out of control ever since. Phil Williams G3YPQ from near Bude noticed its peculiar signal drift caused by its tumbling end over end every 4 seconds as the solar panels become shadowed by the engine. This gives the signal a particularly ghostly sound as the voltage from the solar panels fluctuates. It is likely that the on board batteries have now disintegrated and some other component failure has caused the transmitter on 237 MHz, to start up when the satellite is in sunlight, (much like AO-07). LES1 is about the size of a small car. It is not likely to re-enter the atmosphere for a long time as the orbit is still relatively high and poses no more threat than the thousands of other pieces of space junk in orbit. Phil says it is remarkable to think that electronics built nearly 50 years ago, 12 years before Voyager 1, and long before microprocessors and integrated circuits, is still capable of working in the hostile environs of space. Listening to the signal you can easily imagine the craft tumbling over and over every 4 seconds and the transmitter starting up as the sun rises. He refers to his hobby as 'Radio Archaeology'.

Radio amateurs around the world have responded to the request for telemetry data from the UK smartphone STRaND-1 satellite on 437.568 MHz. See <http://amsat-uk.org/satellites/strand-1/strand-1-telemetry/> for information on the telemetry format. STRaND-1 is the first UK CubeSat in space. It was launched on February 25 at 12:31 UT on the PSLV-C20 rocket from the Indian Space Research Organisation (ISRO) Satish Dhawan space centre. Deployment from the launch vehicle into a 785 km orbit took place about 20 minutes later. The satellite was built and tested in just three months with the mission goal of demonstrating the feasibility of using cheap smartphone electronics to control a spacecraft. At the heart of STRaND-1 is a Google 'Nexus One' smartphone with an Android operating system. Smartphones contain highly advanced technologies and incorporate several key features that are useful in a satellite; such as cameras, radio links, accelerometers and high performance computer processors, almost everything a spacecraft needs except solar panels and propulsion.

As always I am keen to hear about and publish details about your satellite activities, so please drop me an email to <zl3dw@nzart.org.nz> and photos are especially useful. I am also very happy to answer any questions that have you puzzled or will help you get started.

73, *Andrew ZL3DW*

Answers to crossword on p33

Across: (1) tank, (3) polarity, (8) doe, (9) apples, (10) mosfets, (11) is (12) ribs, (13) Ra, (15) eight, (18) near vertical, (21) nu, (22) ink, (24) average, (27) OE, (28) ken, (29) Dr, (30) ore, (32) twins, (33) deserts.

Down: (1) Taumarunui, (2) noise blankers, (3) PACTOR, (4) ampere, (5) idling, (6) toes, (7) yes, (14) airwaves, (16) incur, (17) halogen, (19) victor, (20) inert, (23) node, (25) akin, (26) ens, (31) RT.

Digital Modes

Murray Greenman ZL1BPU
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You will recall that in the last column I introduced the RTL-SDR (TV dongle) for use on VHF, and promised to report on its use on HF as well. So here we have a review of the RTL-SDR on HF, a look back at a real commercial SDR receiver, as well as a review of some more impressive SDR software.

If you're not sure whether Software Defined Radio (SDR) is for you, the inexpensive TV dongle is a good place to start. For a mere US$14 you can learn a lot about what an SDR does and how it does it, and I promise you will be impressed. There is also plenty of help for beginners out there, while holding a local expert's apron strings will also be very helpful.

The Up-Converter

From my previous description, you will know that the cheap RTL-SDR covers a huge range on VHF and UHF, but does nothing for MF or HF. So to include these parts of the spectrum in your SDR adventures, you need an Up Converter. Typically these add 100 MHz to every signal you receive on HF, although the actual conversion oscillator frequency is unimportant. The receiving software knows about Upconverters and can display the received frequency correctly. You could build your own Upconverter with little more than a double-balanced mixer, an XO module, and a few filters.

It's been shown however that the performance of the Upconverter is critically dependent on the performance of the low pass filter before the mixer, and the high pass or bandpass filter after the mixer. Without excellent filters you risk breakthrough from VHF (especially 88 – 108 MHz broadcast FM) and images from low VHF. It is unlikely that you could build a top-notch Upconverter for the US$43 it cost me to buy one[1].

The Upconverter arrived within a couple of weeks of ordering, well packed and very nicely built. It is a surface mount PC board (see the picture in reference [1]), which I was able to fit nicely into a standard 110 x 60mm diecast box with a little patience. The purpose of the box is to protect it physically, to provide thermal stability, and to prevent FM broadcast leakage into the output.

I elected to chop the cable off the antenna which came with the RTL-SDR dongle, and to fit an SMA connector, as my dongle has a tricky (and very small) MCX connector for the antenna. I also made an SMA to BNC adaptor cable for the antenna end of the converter, and found a suitable micro-USB cable to provide power from my laptop. In Figure 1 you can see the converter, dongle, and the adapted antenna cable between them. The converter input SMA connector is out of view on the left. Reference [1] has good pictures of the converter board.

I use SDR# software on VHF, and elected to use HDSDR as my HF receiver, since it is better suited to HF (includes a wideband DRM mode and an excellent ECSS synchronous AM detector). This also meant that I could leave one program set up for direct use of the dongle (converter off/bypassed) and the other for HF (converter on and –100 MHz offset added to software). The HDSDR setup was fairly easy. I first had the dongle calibrated with SDR# so knew what sample rate calibration factor to use in HDSDR, and it was a simple matter of then setting the converter offset precisely so WWV appeared at the right place. I'm listening to WWV on 10 MHz at present, and it's running with an offset of 51 Hz and is quite stable. Remember that the conversion oscillator in the Upconverter is a simple 100 MHz XO, so is neither particularly accurate or temperature stable, though for most applications is adequate. I worked out that mine had an approximate temperature sensitivity of -5ppm/°C.

I found that the system gain changes a little from 500 kHz to 30 MHz, but more particularly the strength of signals is much higher at the lower end, so I need to pop up the RTL settings dialog or HDSDR RF gain control from time to time in order to tweak the gain to improve sensitivity or counter

Figure 1. Photo of converter and dongle setup.

intermodulation, which is easy to recognise on the spectrum display. This effect is probably a reflection on the limited 8-bit A-D in the dongle, rather than any fault of the converter or software.

However, for all that, reception is excellent. The RTL-SDR with Upconverter has all the sensitivity you would need on MF and HF, and will even receive down to 40 kHz with some loss of sensitivity and raised background level. It is also very convenient being able to switch the converter in and out to go from HF to VHF, although I have needed to add a switch box at the converter input to change to appropriate antennae.

HDSDR on HF

HDSDR is impressive and easy to drive after some practice. I was quite amazed at what observing 2 MHz of HF at a time reveals; for example I discovered that my HF antennae have bands of background noise that have stable broad peaks. These peaks correspond to antenna band resonances, and are different for each antenna. You can also see interesting relationships between signals and spot the behaviour of frequency hopping OTHR devices – for example there's one that hops around on 10.2 to 10.6 MHz much of the time (see Figure 4).

The waterfall display makes identifying wider signals such as STANAG 4285 and DRM much easier, and you can very quickly see where the switch-mode power supply interferers are! (See Figure 2). I found it easy to identify where groups of signals are, such as shortwave broadcasting, and with the zoom can easily separate the signals out for tuning in. On the ham bands it's not difficult to find and tune to SSB signals or digital modes using the mouse wheel. Sensitivity, signal clarity and selectivity are excellent. I can pipe the audio out of the receiver directly into a digital application such as FLDIGI, ARGO or Dream DRM.

The quality of AM broadcast reception is very good. The ECSS detector locks in easily and gives very clear low noise audio. 5 kHz whistles which are common on shortwave signals are easily pounced on by simply adjusting the upper passband edge, or by adding one or more of the tunable notches. These are fast to apply, sharp and very deep.

DRM Reception

I've mentioned DRM before, and in New Zealand it's been a great disappointment. Things would be different if we lived in Europe or other areas of large population where the transmissions are directed, but down here it's a DRM desert. Radio NZ International transmit DRM to the Pacific daily, and although the signals here are strong, they are arriving by scatter (since I am in the skip zone) and will not decode. I get best reception from REE Nobeljas in Spain, and have achieved good reception for an hour or so in the evening from All India Radio (GOS IV). I am able to identify Romanian, Russian and NZ signals, but with insufficient SNR for recovered audio. No sign of Radio Australia.

Receiving DRM with the Upconverter, the RTL-SDR dongle, HDSDR software and Dream DRM (got all that, have you?) is reasonably straightforward, and results are just as reliable as the older method I used with an HF receiver and 12kHz IF converter. Reception should be better, as the SDR is not subject to

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Figure 2. DRM from Russia using the RTL-SDR.

image problems that affect a simple IF converter (which also receives signals 24kHz away).

Tuning signals

On VHF the waterfall display is often of less interest, but on HF it really comes into its own. It lets you see frequency hoppers easily, to identify DRM signals, spot chirp sounders and interferers, and easily identify AM and SSB signals by their different patterns. (You can see a switch-mode noise, an AM station and a DRM station in Figure 2). The spectrum display is the best way to tune in the signals by drag, then point-and-click, followed by fine tune using the mouse wheel.

One annoying feature (common to all the programs I've tried) is that if you click on the signal to retune it slightly, nothing will happen if you click within the receiver's demodulator passband. You need either to use the mouse wheel, the frequency display, or click outside the signal bandwidth and then click on the signal again.

Tuning using the numerical display is not the most convenient method, but you are forced to use it from time to time in order to shift the VFO frequency. It's a bit confusing, but most SDR receivers have two means of tuning; the VFO, which defines the centre of the receiving range (typically the synthesizer in the dongle), and the receiving frequency, which sets where the software is focussed within the receiver bandwidth. For example, with a typical RTL-SDR with 2 M samples/sec sampling rate, the receiving bandwidth is about 2 MHz. If you set the VFO to 10 MHz, 10 MHz will be in the centre of the 9 – 11 MHz received range, and you can then tune in any signal in that range, typically by clicking on the screen or by editing the receive frequency display.

If you want to move to some other frequency within the 2 MHz range, simple, just click on the screen, but if you want to move further (say to 7 MHz), you need to move the VFO. This behaviour is quite unlike a regular HF receiver, but you'll understand the action better if you treat the VFO like a bandswitch and the receive frequency like the tuning knob.[2]

The SDR-IQ revisited

If you look back a couple of years[3] you will see that I wrote a review then of the RFSpace SDR-IQ receiver.[4] At the time this was all-new technology and something of a revelation to me. I thought it might be a good idea to have another look at it, now that I've had some experience with the RTL-SDR dongle. My thanks to Chris ZL1BOE for his further patience and generosity for the loan of the unit.

The SDR-IQ is a rather expensive unit (US$525) with very good performance. Well, has the SDR-IQ now been superseded by these new cheapo dongles? In a word, NO! The SDR-IQ has much flatter stable gain, better dynamic range and better intermodulation performance. No messing about with the gain required, and if HF is your thing and the price isn't a problem, a specialized unit such as this is still the best answer.

However, the SDR-IQ is only is able to monitor a 192 kHz wide bandwidth (the dongles easily do 2 MHz), and only covers 100 kHz to 30 MHz, as opposed to 100 kHz to 1700 MHz (with RTL-SDR with and without an Upconverter). If your piggy bank is light, or you need wide coverage or VHF/UHF, go for the cheapo. If HF performance is important, the SDR-IQ and similar units is still the best approach. As a compromise, don't forget the FUNcube dongle, which covers 150 kHz to 1.9 GHz and sells for about £stg 130.

Figure 3. The Studio 1 receiver pane.

I do like using the SDR-IQ. It works very well with my little netbook computer, which struggles with the RTL-SDR no matter what sample rate I select. For HF use this specialized HF SDR also works straight out of the box, with no need for an Upconverter. For portable operation, a dedicated HF SDR is still the best way to go if you can afford it.

Studio 1

This month I've also had an opportunity to play with some really excellent commercial SDR software. Studio 1 is very comprehensive[5] and very nice to 'drive'. The software has multiple windows, for example a separate virtual receiver front panel, a spectrum/waterfall display and a close-in signal spectrum/waterfall display, and the receiver will operate with any or all of these showing or closed. You can also have multiple receivers, assuming you have enough screen space and processor power on the computer. The processor load is noticeably lower than with SDR# or HDSDR.

The Studio 1 displays are very tidy, good looking, with nicely rendered and very detailed graphics. It took me a little while to get used to operating it, but I really like it. There is one interesting aspect of the design; it has only one frequency display, the actual demodulator frequency. You can't independently change the VFO frequency. I'm not sure how this is actually changed, as it appears that if you move only a short distance (within the current receiver range, say 2 MHz), only the demodulator frequency changes, while for larger shifts the VFO (i.e. in the tuner) obviously also changes, although there's no way to know when it changes or where it is. This behaviour has some effect on the tuning behaviour when the display is zoomed. However it makes the virtual receiver behave much more like a conventional one.

I don't like the SAM (synchronous AM) detector much, as it does not lock unless you tune within 100 Hz or so, and that can sometimes be difficult. Although the software has AFC, I've not found a way to make it pull in and lock on a shortwave station anywhere near as well as HDSDR does. This makes tuning shortwave stations rather clumsy. Once tuned, however, the reception is excellent. I have no criticism of the reception in other modes, and the spectrum displays are excellent. It took me a while to get the waterfall display working to my satisfaction, as with default settings it was difficult to determine where 20 m SSB signals were.

There is at present no frequency manager function. Studio 1 is quite expensive (€149), and is protected by a key dongle and licence file. Clearly you need yet another USB

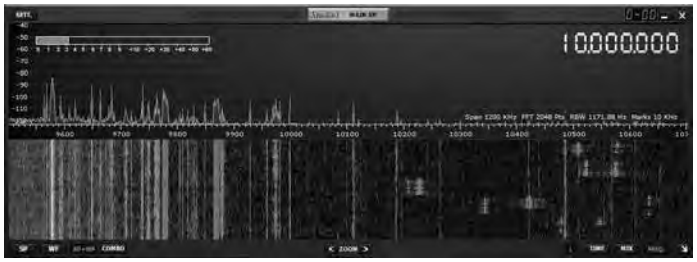
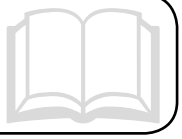


Figure 4. Studio 1 waterfall showing AM and DRM signals and that pesky OTHR.

Magazine Survey

Compiled by Grahame Fraser ZL3SJ
<grahame.fraser@canterbury.ac.nz>



Amateur Radio (WIA)

January/February 2013

p6 A key with a difference (a timber key which works)
p7 Cheaply improving Morse DX reception (ways for binaural reception)
p10 APRS in radio controlled model aircraft
p14 HF's 'gig guide': the low down on the best bands ('a broad guide to propagation and regional differences')
p16 Why always pick on the poor 'V'?: More about the dreaded 'diddly-dahs'!
p19 An HF crystal set: a practical exercise in refined simplicity
p23 Foundation Corner 22: A hands on review of the Wouxon KG-UV6D hand held
p28 Product Review: Hendricks QRP Kits PFR-3A (40, 30, 20m)

CQ

February 2013

p46 Emergency Power
p63 Digital Voice Revisited
p68 QRP: Winter Do-It-Yourself Projects

March 2013 QRP Special

p13 On the Edge: Using QRP Next to Saltwater
p32 CQ Reviews: Ten-Tec Argonaut VI QRP Transceiver
p52 Raspberry Pi: A Tiny Computer for Big Projects

QST

February 2013

p30 A Three to One Dummy Load (50 and 150 ohm loads;can also check SWR meter and antenna tuner)
p33 A Remotely Band Switched Tower Shunt Feed for 160 and 80 meters
p37 Q and the Energy Stored Around Antennas
p39 The Penticton Solar Flux Receiver
p46 Modern ATV System Design
p50 How High Should You Hang that Wire Antenna ?
p52 Product Review: TEN_TEC Model 418 100 W HF and 6 Meter Linear Amplifier
p55 Product Review: Rigol Technologies DSA815-TG Spectrum Ananlyzer
p62 Hands-On Radio #121: Transient protection
p65 Watching Meteors – Among Other Things

March 2013

p30 A Different Way to Make a Tilt-Over Mount and Mast
p34 A Wideband Dipole for 75 and 80 Meters
p37 Two Simple Antennas for 1200 MHz
p39 Dual-Band Homebrew (6 and 10 m)
p43 A Tilt-Over Antenna Mast Born of Necessity
p45 The Case for Stacking Yagi Antennas
p46 The Technician 6 and 10 Meter Special
p48 The Sun and the Ionosphere
p51 Product Review: Tokyo Hy-Power Labs HL-550FX Linear Amplifier
p59 Noise Problems for Broadcast and MF/HF Receivers
p61 Smarten up that dummy load with a monitor port
p62 Hands-On Radio #122: Battery Characteristics - Part 1
p69 The 11 Square Foot Ham Shack
p79 2012 Marks All-Time High for Amateur Radio Licenses (709,500 in US)
p98 Vintage Radio:PR-35 Spy Radio

RadCom

February 2013

p18 Homebrew:Crystal IF filters
p22 Getting started in ... beacons, part 1
p23 12V computer power supplies (with much caution, can be useful)
p32 Antennas: The time domain reflectometer
p38 RSGB Band Plan 2013
EMC: Solar photovoltaic systems (and their inverter noise)
p52 Transceiver power levelling (minimising variation across the useful spectrum)
p54 Data: A detailed look at the new WSJT mode, ISCAT
p60 GHz Bands:New microwave PA designs plus a propagation refresher
p62 The FUNcube Dongle Pro+ (SDR for the FUNcube satellite educational project)
p72 Start Here: Concluding the Tesla coil details
p74 Sport Radio: How to compete on 160m from a small garden

March 2013

p14 Homebrew: Continuing our series of simple receiver projects (crystal filters)
p18 Solar Cycles and F-Layer Propagation
p23 Antennas: Mobile antenna mounts(including EZNEC model of antenna + car)
p25 The 'Perfect' VOX (never misses the first syllable)
p30 Getting started in ... beacons, part 2
p32 Start Here: A very useful tuneable bandpass filter for MF listeners
p37 Design Notes: Integrated frequency multipliers
p37 A novel 472-479 kHz antenna (earth-electrode pair)

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port to plug the key into, and the software won't receive at all without it. However, if you are using it with a top of the range receiver such as an SDR-IQ or Perseus, the software cost will be well justified by the performance, which will then rival that of a $3000 conventional receiver.

SDR Hardware compatibility

I tested the Studio 1 software with both my RTL-SDR dongle and the RFSpace SDR-IQ. It supports a wide range of other SDR receivers. I also tested the RTL-SDR and SDR-IQ with HDSDR. What allows this to happen is a special 'EXTIO' DLL file which defines the operation of each receiver. You simply drop the DLL file for your receiver (e.g. ExtIO_RTL.dll for the RTL-SDR) into the software operating folder, and the software will pick this up and operate correctly with your receiver. This allows these programs to operate with quite a range of hardware.

Once you are operating the receiver, you can call up a direct control box for your SDR provided by the DLL, which might include frequency correction, gain, AGC and sample rate settings. HDSDR and SDR# include a special button to pop up this dialog.

Final bits

So much is happening at present! In my next column I will have news of an interesting discussion between myself, Con ZL2AFP and Peter G3PLX. Peter is developing an improved MFSK mode for low HF (80/60/40 m), hoping to convince European users that there is a more effective alternative to Olivia. You may soon hear this under test locally.

I also want to tell you about ITU recognition of Amateur modes; including PSK31 and MFSK16, and I hope to have news of the new ZL1QM Weaver transceiver for MF/HF, which I have recently heard on the air.

References

[1] <http://www.nooelec.com/store/ham-it-up-v1-0-rf-upconverter-for-software-defined-radio.html>
[2] The latest SDR# has only one tuning display, as has Studio 1
[3] *Break-In* Jan-Feb 2011
[4] <http://www.rfspace.com/RFSPACE/SDR-IQ.html>
[5] <http://www.woodboxradio.com/studio1.html>

Around the Branches

RadioTek – Yet another day of radio technology at Branch 05

This was meant to be the last RadioTek to be held in our clubrooms, but we have now obtained an extension to our Red Zone eviction date, so we will be there for a few more months yet. You see, we are becoming attached to our pot holes, abandoned houses, flooded car park and broken roads. In spite of these difficulties we had ten students come for the day, with two of them first timers. It was great to see many of the fathers come along too, as we feel this is a good way to spread the word about Amateur Radio.

The beginners built a wiggly wire steady hand game, and then a simple AM radio. Second timers added a speaker amplifier to their radio, and the third timers added the FM adapter.

As always, we are constantly looking for ways to improve the projects we offer to the students. The current projects are very much built from discrete components, and we are starting to consider adding some more complex projects made from "modules" (RF, microcontrollers etc) as this will probably be the types of systems these young engineers will be working with in their future careers.

At the end of the day, when all the projects had been completed, we had a few faults to fix, and mostly they were not wiring or assembly faults, but component failures, which is very strange. Maybe we need to revise our electro-static handling techniques. However, all the issues were eventually resolved, despite one of our more mature students wanting to take her partly working radio home "working or not". It goes against our professional pride to allow that to happen.

As usual, we ended up with a room full of happy students, all wanting to return at the next Radiotek meeting. They were even happier when we invited them to take as much electronic junk home as possible, they went out the door with armfuls.

The mentor team also wanted to return for the next session; Rory ZL3HB, Brian ZL2BAT, Graeme ZL3GSL, Barry ZL3BMW, Ken ZL4KD, Ron ZL3RON, Rod ZL-3ROD, Kelvin ZL3KB

The next RadioTek day is scheduled for 19 May 2013, who knows if this will be the last RadioTek at the Galbraith clubrooms? What challenges lie on the horizon for Branch05?

If you want to help us spread the word, the booking contact details are Rory Deans 03 344 6292 or <rory1@xtra.co.nz> with our website at <http://www.radiotek.org.nz/>

Kelvin Barnsdale ZL3KB

Branch 74 Wellington VHF Digital Television Test Transmissions

In late December 2012, Radio Spectrum Management (RSM) granted Licence 236831. The details can be found on page 28 of January/February 2013 *Break-In*.

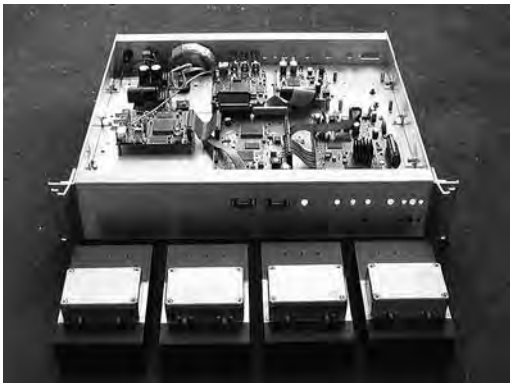
The first test transmission on the 13 of February, in cooperation with the users of the adjacent channels, successfully demonstrated that we can co-exist. At their request, our transmission consisted of an unmodulated CW carrier on 506 MHz, in the centre of the channel, at the maximum licensed power.

The CW transmission continues. Calibrated coverage measurements, at more than twelve locations, have confirmed that the transmit antenna is performing as expected. Reception reports are welcome.

The next compatibility test transmission (not yet scheduled, at the time of writing) will use the same DVB-T modulation format as Freeview ® and be receivable on domestic digital TV receivers.

The photograph shows the 100 milliwatt DVB-T exciter, and the four power amplifier modules that will be operated in parallel to obtain the required output power.

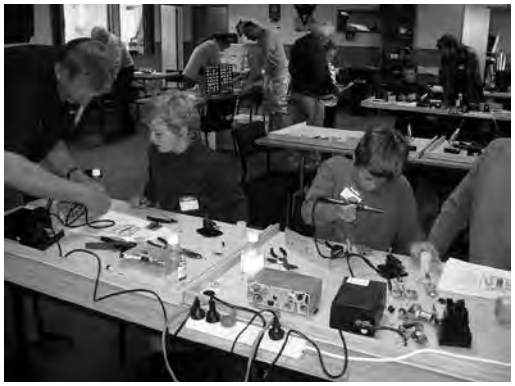
Father and son team.



DVB-T exciter.

A student working on his speaker amplifier RT 1.

Father and daughter work it out together.



Students have to do all the work themselves.

ZL3ROD helpd Damien with his soldering.

AREC – Amateaur Radio Emergency Communications

Geoff Gillman ZL3QR and Bev Gillman ZL3OV

AREC Mission Statement:
To be the preferred provider of Emergency Communications to New Zealand Emergency Services.

Hi, Everyone. In November last year, the biennial Silverfern Rally, previously held in the South Island, came north for the first time. Here is the story of the management of such an event. Enjoy.

Silver Fern Rally 2012

The Silverfern Rally last year was the largest comms event I have ever been involved with. The first car rally I was asked to assist with was the Hawkes Bay Rally in 2005. I must say I enjoy organising communications for events, as I believe it is the glue between our hobby and the rest of the world. It provides us with an opportunity to integrate with other hobbies and prove our readiness, while honing our operating skills and prowess. The scale of the Silverfern is unlike any I have dealt with to this point. The brief included;

- provide start / finish line comms from 43 stages located around the North Island back to HQ in Hamilton
- provide 15 km safety point comms from various stages back to HQ in Hamilton
- equip and man HQ in Hamilton for the 7 day event
- set up links and interconnects to facilitate the above

Seven days is a long time for an event. Most club car rallies occur in the weekend, but this one began on Sunday and finished on Saturday. This was going to mean annual leave. One has to also be aware of fatigue over such a long timeframe.

In car rallys I usually supply 3 networks that are essentially independent of each other. A results network, for passing the start and finish timing information from each stage to base, a mids network for passing car tracking information (in this case and for the first time, we also passed split time information on this network) and the third network is the control channel, which essentially passes everything else. This includes safety and emergency traffic as well as looking after our own logistics. This network needs to be on VHF to allow for mobile operation. Additional to the standard, we also made use of Action net, and APRS, as well as the good old 900 MHz GSM network. Here is each network in detail, and how it was achieved.

The results network. This was primarily on 40 m HF using 7200 USB, and 3875 USB. We found 40 m the more reliable however 80 m was required first thing in the morning until the glowing ball of Hydrogen got high enough to spray the ionosphere in charged particles, making 40 m the more optimal band. Operators set up dipoles using various masts and arrangements. HF did give us a few problems Thursday morning, during a CME, comms were extremely difficult during this period. At base, to get the results information back to HQ, a remote controlled UHF repeater / HF link was used. It was set up portable in a dairy farmer's paddock on the outskirts of Hamilton away from city noise and interference.

The mids network was very similar to the results network. We used 7150 and 3825 USB. Why USB? It has been a convention for AREC to use USB as commercial radios (sometimes used) do not usually have LSB facilities. Amateur radio is one of the few organisations still using LSB, and the reasons for doing so have long since passed. HF was received by an HF remote in the middle of Claudelands Park and relayed back to HQ via a UHF repeater as with results.

Grant ZL2bk set up on stage 28.

Rally results table (foreground) and Rally control (backround).

ZL2AJ-1 Repeater trailer setup.

Setting up 6925 / ZL2AJ-1 Repeater trailer.

The control network. This was a complicated little beastie as we had to access various repeaters around the North Island from Hamilton. The repeaters on Day 1 were relatively easy. 6625 and 695 could all be accessed direct from Hamilton. For Day 2 we used 735, 700 and 685. These were not accessible from Hamilton so we had two remote VHF links (with UHF repeaters back to Hamilton) to achieve this. One was located on the Kaimai ranges and the other near Coromandel. I also had deployed a 6925 repeater to a hilltop near Gisborne to fill in. 6925 is fitted with a UHF port and this was linked into 9175 at Clifton which could then link to 40m, back to Hamilton. 6925 is housed in a solar trailer with 100W of solar, 3 large batteries, APRS digi, and the repeater and filters. This makes it very quick and easy to establish. Day 3 we used 690 and 725 repeaters. The only way to access these was by using IRLP. Node 6793 was directed onto 690 for the morning and switched to back 725 after lunch. 6925 was parked up at a high point on Cricklewood Rd and was linked via Clifton and 40m back to Hamilton. At Hamilton we had the use of 2 simplex IRLP nodes and were able to disable the inactivity timers to hold the connection. Day 4 we used 670 and 5625 repeaters. 5625 was linked back to IRLP via node 6910. 670 was linked to 7125 before the event started and this allowed us to use the Manawatu IRLP 6943 to get us back to Hamilton. The repeaters we linked up prior to the event were 670, 7125 and 690 (Wanganui). Day 5 we used 690 Wanganui, and 7125 Manawatu, along with 6925 linked in located at Tapuae. I also linked in 6825 from a hilltop near 6775's location using the car as a pseudo repeater cross-linking back to the chain of repeaters. All this was carried back to Hamilton via IRLP. The number of links in the chain, although they were primarily in star configuration, did create some delays and a few operators struggled with remembering this at times. An opportunity for training in AREC exists here as sometimes adhoc links, with key up delays, can exist in a real event. Day 6 we primarily used 675 Taupo and 715

continued on page 42

Rob ZL2SG and Adrienne ZL1COM operating at Rally HQ.

◂ *continued from page 41*

Taumarunui repeaters; and accessed this from the UHF to VHF remote links. Day 7 we used 7375 repeater primarily, and this was accessible directly from base.

Other networks we had was Action Net, kindly donated to us. This is a trunking one on one network but it was useful backup for some operators who had the radios in times of need. I used it often to HQ to manage comms during the event. We had permission to use the National System but were fortunate not to have required it. It was good knowing it was there is required and I am grateful to the Trustees who gave their permission for this to happen. And when everything else fails we had use of the cellular network when coverage was available. It always pays to include this in any comms plan as it is a valid form of communication and can sometimes get you out of a hole.

Rally HQ. We staffed HQ with a manager, 2 full time operators, and 2 part time operators. Ideally we would have liked another 2 full time operators for HQ but they were not forthcoming. The bulk of the radio equipment in HQ was Tait commercial radio equipment. Each was fitted with an auxiliary port, coupled into a hands-free box (*Break-In* article coming soon) and to a headset and foot switch. Local HF transceivers were available at HQ in the event of a remote HF failure, or propagation issues. A purpose coded access program was written to allow us to keep track of operators and their status, as well as their contact information. APRS and Spider track screens were also running, to allow us to monitor the locations of volunteer's and officials. To enable us to secure the venue in the evenings, 2 windows were deglazed and replaced with ply, allowing us to drill holes to run coaxial feedlines through. We also had our own printer and guillotine for printing message forms, results forms and the like. Our computers were all networked on to the motorsport network allowing us to direct enter some information into their database, and provide us with internet access.

So what was my role in this event? Well here is a short list of some of the tasks I had to perform

- liaise with rally management, and keep them updated on issues
- formulate a budget for the event, and stick to it
- update procedures, information documents, maps, site information and distribute
- plot the rally route, identify comms points and check comms options and potential issues
- develop a comms plan to meet the requirements of the event, and backup systems
- source volunteers for the event, and supply them with up to date relevant information
- source equipment for portable repeaters and headquarters
- source accommodation for volunteers (delegated)
- liaise with equipment owners (local clubs) for permissions to use equipment
- liaise with other interested parties about various matters

I will be the first to admit that not all of the tasks were completed to my satisfaction but the above list does make light of the fact that this is a large scale event. An event of this size does create its own issues. Some of the issues I encountered were

- large geographical area
- sourcing competent volunteers
- dealing with many branches, many of which I had minimal previous relations with
- many, many kilometres I travelled (over 4200 km during the event plus many more leading up to the event for meetings and mapping the course)
- managing various operators and maximising the skills each brought to the event

From the feedback forms some of the positive comments that were returned included;– From the officials point of view, all would have appeared to run to plan and the rally officials would not have had anything to complain about. In that sense it all went well. This is not the only rally where this is the case and in Rally NZ we often have the same where things don't go exactly to plan; looking all OK even if it's not. The weather was mostly fine and the work load far from strenuous.

VHF network desk 1.

Really appreciate the effort the field operators put into getting the best signal they could into as many frequencies they could get at a given time. Great work!!

Had great time and all went well for us.

That said there is a lot we can always learn and I plan on discussing some of the issues with AREC management as things return to normal. The question should always be "how can we do this better next time". I understand there will be a next time, and I look forward to being involved again. Our involvement with motorsport in this country is something all amateur radio can be proud of. It gives us an opportunity to learn new ways of doing things that can really matter should an emergency ever occur.

All in all I was impressed by the quality of operating in the field, and the ability of those at base to deal with the unforeseen and manage the networks appropriately when given challenging situations. I would be happy to work with all again next time.

Warren Harris ZL2AJ
Event Comms Manager
(SFR 2012 Organising Committee)

Activity Briefs

(A selection from Jan/Feb.)

10/1/2013. Wairarapa Branch 46. Sports & Training. Castlepoint. Annual Castlepoint Fishing Competition. 41 boats registered with an average of 4 per boat as well as land based fishing. .All comms on AREC Marine repeater.

12/1/2013. Wairarapa Branch 46. SAR. Tora Coast, Southern Wairarapa Search for fisherman who failed to return from checking crayfish pots. Inflatable dingy located 60 km out to sea and no sign of fisherman.

12/1/2013. Balclutha Branch 35. SAR. Clutha River. Search for missing person in river No result

13/1/2013. Balclutha Branch 35. SAR. Clutha River. Further river search for missing person. Unsuccessful.

14/1/2013. Balclutha Branch 35. SAR. Clutha River. River search for missing person. No result

19/1/2013. North Canterbury Branch 68. Rural Fire. Eyrewell Forest Paddock fire within fire boundary of Eyrewell Forest. Call for one Forestry Unit to assist with mopping up operations at Rural Fire. AREC supplied comms/logistics for Forestry Unit.

19/1/2013. Balclutha Branch 35. SAR. Clutha River. River search for missing person Body found 14 km downstream from entry point

25/1/2013. Marton Branch 23. SAR. National Park. French tourist day walker failed to return by evening, separated from walking partner and missed poled track and wondered well off track. Over-nighted in open and located fit and well by FIRST Team at 1100 hr next day Responded but turned back en route as LP had been located.

28/1/2013. Otago Branch 30. SAR. Outram Glen. Search for a mentally ill woman who went missing while walking with a care giver. They were with a group who were walking a track that followed the Taieri River upstream from the bridge at Outram Glen. After approximately 8 hours the search was scaled back with 2 teams providing containment over night. The woman was located by one of the containment teams in the morning when she walked out of the search area.

2/2/2013. Otago Branch 30. SAR. Highgrove, Dunedin City. Search for a 5 m pleasure boat that had drifted into the rocks after the motor failed. AREC provided a relay on Marine CH 69 between the search teams in IRB's back to the base at St Clair.

6/2/2013. Auckland VHF Group Branch 66. CD. Auckland City. On standby in case of tsunami after strength 8 earthquake off Solomon Islands. On standby for 12 hours, no action required.

7/2/2013. Southland Branch 37. SAR Training. Branch 37 Club Rooms. Landsar Monthly Training We assisted Southland Landsar with training their members on Radio Communications. The evening consisted of basic radio voice procedures and minimum team equipment requirements. Also touched on how to operate the Tait TP8115 VHF Handhelds. The evening concluded with an exercise setting up the portable repeater and having a contact with ZL4LC/ZK4EB in Eastern Southland on the Polsar HF Radio.

7/2/2013. Otago Branch 30. SAR. Karitane. Search for an overdue 16 ft pleasure craft. Radio communications were provided between 3 search boats and the management team in the Dunedin Central Police Station via the Marine CH62 repeater. Communication with the Rescue Co ordination Centre was via Marine CH16.The missing vessel was located safe and well in the bay just outside the Karitane Harbour some 2.5 hours into the search.

9/2/2013. Balclutha Branch 35. Sports & Training. Clinton – Waipahi Hills Trail Bike Ride as fund-raiser for the local primary schools. Approx 400 bikes enjoyed a good day's sport.

16/2/2013. Thames Branch 41. Sports & Training. Hills behind Thames. Safety communications for Adventure Racing Coromandel 24 hour/12 hour events. Very good safety comms.

16-17/2/2013. Franklin Branch 10. Sports & Training. Coromandel Adventure Race Competitor safety.

17/2/2013. Otago Branch 30. SAR. Taieri Plains. Search for a 61 year old male contractor who was overdue from a day of spraying weeds around power pylons between Dunedin and Waipori. Radio communication was provided via the Dunedin City Civil Defence CDA Repeater. A helicopter flew the route of the power pylons and the man was located some 2 hours into the search. The man had crashed his vehicle on private land but unfortunately didn't survive the crash.

2/3/2013. Southland Branch 37. Sports & Training. Donovan Park, Invercargill. Southland A&P Show. The section setup and displayed the AREC vehicle. We also assisted the Red Cross with Communications for the event.

Conclusion

Thanks to those who have contributed to this issue. Material for the next one to please be in our hands by 3rd May 2013. Photos, if included. preferably on a separate CD (with captions) mailed directly to us. E-mail pix may be acceptable but will be at the Editor's discretion and must not be embedded in the text. Contact details: <zl3qr@nzart.org.nz> or <zl3ov@nzart.org.nz> or post to 6 Boyd Street, Rangiora 7400, or phone (03) 313 7137.

(N/B. Articles to please be in doc, rtf or txt format. Publisher or pdf we can not use. Thanks.)

Reminder

The next Section Leaders Nets should be 15 April and 20 May, 3900 kHz USB at 1930 hr NZST unless notified otherwise.

Until next issue,

73, *Geoff ZL3QR & Bev ZL3OV*

QSL Bureau

by Barry Stewart ZL2RR
<zl2rr@xtra.co.nz>

Greetings from Bureau Headquarters, Wanganui. Very little activity to report on this month: The year's first posting of a 5kg package each to the ZL1 and ZL2 Sub-bureaux was made during on February. During January and February three by 700 gram envelopes of QSL Cards were forwarded to the ZL3 Sub-bureau along with two of the same to ZL4.

I was absent from home early February for a few days tramping in the Tararuas as a warm-up for our mid-month tramp in the Lewis Pass area and crossing over the Waiau Pass into the Nelson Lakes National Park. Unfortunately, a slip in the Ohau River resulted in cracking my knee on a boulder resulting in my favouring the left leg for the rest of the time in the Tararuas; this action causing a hamstring problem which resulted in my deciding that I wouldn't want to tramp with me down South whilst in that physical condition so very reluctantly pulled out of the Southern sojourn. At my age, I think that is one tramp that has got away! As a result there has been no delay in servicing members QSL needs!

Recently I received an envelope I had mailed to Lithuania (LY) late December. The label address was crossed out with 'Return to Sender, address unknown' endorsed on the envelope. I sent an address enquiry away to the LY National Office but no response has resulted from that quarter and, with being unable to find any information about a change of location, reposted the envelope to the usual address. Hopefully, better luck this time around!

If you have the quantity of cards to post to the Bureau, the cheapest option is to use an 'Extra Large' C4 Envelope (230mm x 325mm). In this, one can put four 10 mil thick bundles of QSL cards at the cost of $2.10 postage (Three 'Kiwi' stamps). This size envelope is rather more expensive to buy though NZ Post does sell this size envelope with postage included if you need only one or two.

A 70c envelope has a maximum thickness limit of 5mm which equates to few cards! An A5 (C5E) envelope will take two bundles of cards 10mm thick and cost $1.40 to post: a far better option than using 3 or more 70c envelopes for a small number of cards.

The Universal Postal Union has introduced the newest model of the International Reply Coupon (IRC). The Doha model; so named for the 25th Universal Postal Congress that took place in Doha, Qatar in October 2012, will replace the current model, known as the Nairobi model. Although the US Postal Service and the UK's PO (amongst others) no longer sell IRCs, they are still available in other countries and post offices in the US and UK are mandated to redeem them. The Doha model IRC will be available for purchase on July 1, 2013. It is valid for exchange until the end of 2017.

The present Nairobi model remains valid until December 31, 2013 so make use of IRCs on hand over the next eight months to ensure they can be cashed by the receivers before the deadline..

The Association thank those members who include a donation with their QSL cards from time to time. This generosity with helping to assist in reducing the Bureau's operating costs is most welcome..

If you have any questions, queries (QSL managers' addresses, etc) or comments please feel free to contact me either via mail (1 Caversham Road, Westmere, Wanganui 4501 or PO Box 857, Wanganui Mail Centre 4540), or Email: <ZL2RR@xtra.co.nz>

73, *Barry ZL2RR*

Contests

Contest Manager: Frank Hunt ZL2BR
<2bfrank@orcon.net.nz>

Contests

There are two types of contesters;

a) serious; will try and operate for the whole period of the contest, hopes to win or get a good place in a category and always sends in a log.
b) not serious; only operates for a few hours and may send in a log or probably more likely won't send in a log.

Interest amongst NZ amateurs in operating in international contests seems to be on the decline. Some may this think is because the average age of NZ hams is rising and our numbers are falling. However judging by the number of logs being submitted for the more popular international contests, in most other countries the number of contesters is increasing significantly.

So what's the problem in NZ then? I must admit that I don't really know the answer and I don't really think that there is just one answer. However one reason could be, log-keeping and sending in logs.

The organisers of all international contests these days want electronic logs generated by computer contest logging programmes in a standard format and many international contest organisers no longer accept paper logs at all. For contests such as the popular *CQ Magazine* contests, logs must be submitted no later than five days after the contest. But this is no problem if you use a contest logging programme, hell you can submit your log five minutes, not five days, after the contest finishes!

Please refer page 5-1 of the current NZART *Call Book* for more information about logs and software. If you want further information or help on using computer contest logging programmes, you just have to ask and I'll do my best to help you.

JIDX CW Contest

The Japanese International DX Contest a very friendly and fun contest, organised by the JA 59 ham radio magazine, is one of my favourites. The JIDX Phone contest is held in November.

VOLTA DX RTTY Contest

This has an almost unique scoring scheme, because the points scored for each contact are directly proportional to the distance between the zones of the stations in contact. So it's a good contest for ZL stations because we are distance advantaged compared with major population centres of the northern hemisphere.

CQ WPX CW Contest

A very popular contest, heaps of categories, lots of certificates to be won and it's really not that hard for ZL's to make a few hundred contacts in just a few hours operating. Many rare DXCC entities and DX-expedition stations show up for this contest. It's all about working call-sign prefix multipliers (WPX) of course and there always lots of unusual prefixes that appear each year.

Straight Key Night Contest 2012

Open QRP Section

1st Jack Culloty ZL1AJ 30 points
2nd Ian MacQuillan ZL2AIM 27 points
3rd Joe Willan ZL2BIT 24 points
4th= Tony Locke ZL2AEL 15 points
4th= Trevor King ZL2AKW 15 points
6th Les Jury ZL2JU 10.5 points

Extreme QRP Section

1st Gilbert Best ZL3GIL 6 points

Open QRO Section

1st Barry Davenport ZL2LN 21 points
2nd Alastair Christie ZL2ARC 17 points
3rd Bob Morris ZL2AVM 10 points
4th Tony Fletcher ZL2ALJ 6 points

Ken ZL1AIH

Awards

Awards Manager: Alan Chapman ZL3GX
<awards@nzart.org.nz>

Last year saw the deletion of the Rhododendron Award and no Conference Award. It is good to see a replacement award for the Rhododendron Award and a Conference Award this year. Unfortunately I will be out of the country spending the Kids' Inheritance Money again so I won't be able to take part in the Conference Award.

Please remember this column is for anyone running awards either long term or short term. But you need to get the details to me in time for publication remembering *Break-In* is only published alternative months.

NZART Conference Award 2013

For contacts made with Branch 46 members, hosting branch for the 2013 NZART Conference to be held at the Copthorne Hotel, Solway, Masterton, 31st May to 2 June 2013.

The award will run from Monday 20th May and conclude on Saturday 1st June. Contacts made in that period with any of the following stations will qualify:-

- Branch call ZL20A5 pt
- Branch YL Member 2 pt
- Branch Member pt

A total of 10 points, including the compulsory Branch call (ZL20A) is required. Contacts can be made on any band or mode HF/VHF/UHF/ National System.

Award applications, including a log of contacts made and $5.00, to be received no later than 30 June 2013 to:-

The Awards Manager
Branch 46 NZART
PO Box 860
Masterton

A certificate commemorating the activity will be posted to applicants soon after the concluding date.

Rhododendron Festival Award; now Taranaki Award

Branch 27 has run this award for many years and last year due to ill health within the committee it was decided to have a year's break.

We have been discussing the Award and have decided because of the garden Festival sponsors continually changing the name, we would create a completely new Award. After consideration the Club has decided on a completely new award called Taranaki Award which will be run from the 10th August till 18th August. As we have not obtained our new call-sign yet or completed the rules these will be included in the next WARO *Break-In*. The Award will run for a full week as The Rhododendron Award used to do so should be great fun.

Ngaire ZL2UJT

Club Awards

Clubs running short-term awards or new awards should send details of the award to me via email or at my *Call Book* address or the address below. Remember that *Break-In* is only published on even months and copy, including, if possible, a copy of the certificate, for inclusion, should reach me by the end of the even month.

The Awards Net runs on 80m, 3.677 MHz every night from 0800 UTC every night of the year. Every one is welcome to join in especially if you are mobile and in a rare county or district.

NZART Awards Manager, PO Box 1733, Christchurch 8140. <awards@nzart.org.nz> <www.nzart.org.nz/activities/awards/>

International HF Contest Calendar for April – June 2013*

Contest	Dates	Times (UTC)	Website
JIDX CW	Apr 13/14	0700 Sat – 1300 Sun	http://jidx.org>
SP DX RTTY	Apr 27/28	1200 Sat – 1200 Sun	<www.pkrvg.org/zbior.html>
ARI International DX	May 4/5	2000 Sat – 2000 Sun	<www.qsl.net/contest_ari/>
VOLTA DX RTTY	May 11/12	1200 Sat – 1200 Sun	<www.contestvolta.com>
CQ WPX CW	May 25/26	0000 Sat – 2400 Sun	<www.cqwpx.com>
All Asian DX CW	Jun 15/16	0000 Sat – 2400 Sun	<www.jarl.or.jp/English>

*Sorry there is not much in the way of popular phone contests for the April-June period.

VHF Scene

Simon Watt-Wyness ZL1SWW
<zl1sww@nzart.org.nz>

Well, what great weather we have had over the last months! It may not be so good for the farmers etc, but it's been good to see so many people out enjoying the light evenings and getting active in their hobbies they chose to do. It's certainly good weather to get outside and fix those antennas ready for the upcoming colder months. On with the column.

6 Metre Activity

I haven't had much feedback in regard to activity on the 6 m band but do see that there have been many spots from VK3 & 7 hearing our ZL2WHO and ZL3SIX beacons. ZL has been hearing the FK8SIX beacon in. (The scribe often hears this one in for days at a time).

On the 15 through 17 February, Bob ZL1RS has been busy working in to the states with NW0W, KD5PBR, TI5XP in EK70NM, TI5/N5BEK, TI5/N5BEK in EJ79TX. On Feb 20-21 Bob also worked KA9CFD, K7SP, W9RPM, W0OGH, W7RV, K5ZQ, K6DEX and others.

Kerry ZL2TPY worked FK8CP and also heard the JA6YBR beacon on the 28 February.

2 Metre / 70 cm Activity

With the DX weekend contest, there was quite a flurry of activity over that weekend along with the WSJT activities had within ZL and across to VK. Rod ZL3NW was hearing the ZL2UHF beacon on 144.275 strongly. During the contest weekend, some really good contacts were had on 2 m with ZL3ADT and ZL3THQ working ZL2ADU at a mean 455 km distance. The same time Simon ZL2FAE worked ZL4AA 666 km.

Throughout the rest of February, Steve ZL1TPH has been hearing the Wellington beacon often. ZL1AA and ZL2FAE worked at about 600 km on 70 cm during the DX weekend also.

Steve ZL1TPH noted an error on the WLG VHF Group Web page in the VHF-UHF Field Day 2012 Contest Results in regard to an incorrect distance recorded in the "Best DX" section, between ZL2ADU and ZL4OX, the distance was erroneously placed up on the site as 4489 km where it should actually be 2399.1 km. As this site is looked at by many overseas, we don't want this misconstrued as a new distance record hence the correction is placed here in the interim.

Steve ZL1TPH also comments "On Sunday 6th Jan 2013 NZST ZL stations enjoyed an intense tropo opening to VK2, VK3, and VK5 with tropospheric ducting. The VK5RSE 144.550 MHz beacon was heard on the 5th Jan UTC around 2130 at 3018 km tropo (not Es). My location was RF73HM at 350 m ASL looking west to Australia with sea views. In the log 144 MHz that day (in order worked) (in brackets also 432);

VK2DO, VK2NC, VK3DUT, VK3KH, VK3AMZ, VK2AH, VK5DK (2995 km) VK3EK, VK-3BDL, VK3GHZ, VK2IJM, VK3II, VK5RSE beacon (3018 km) VK2BCC, VK2ZT, VK3OE (also 432 at 2594 km) VK3AMZ, VK2DVZ, VK2ZT, VK2KOL, VK2TWR, VK2DX, VK-2BCC, VK2ARA, VK2GKA, VK1BG, VK2EMA, VK2MAX"

Microwaves

During the contest period there was a bit of activity in the SHF bands, details follow below:

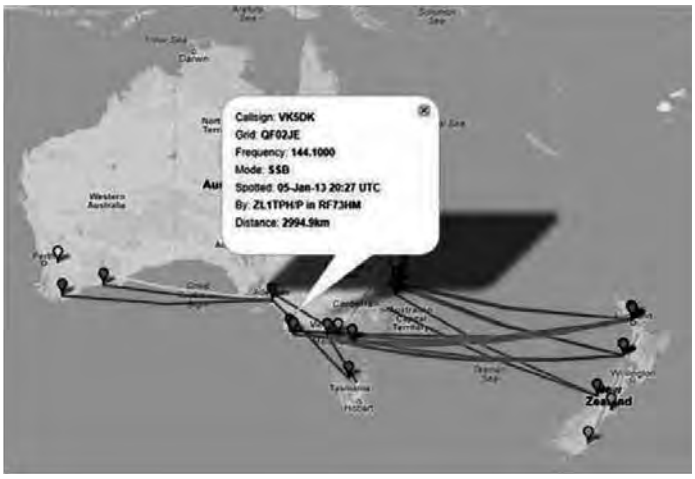
ZL4AA team worked ZL3NW, ZL3THQ, ZL3ADT on 1296.

ZL1TPH/P and ZL1AA worked ZL2BKC North Mt Taranaki and ZL1BK on Ruapehu on 5760.1000 SSB. Steve was also hearing the ZL2UHF beacon on 1296.2750 533.0 km from his home QTH.

Contest activity

There was a lot of activity amongst a group of avid contesters. Wayne ZL2BKC comments. "I operated from North Egmont for the first time. For the record I have done Stratford Plateau several times and hiked to transmitter site once, and was surprised at how much Nth Egmont has changed since I was last there.

Took all bands as I was keen to test out the Microwave stuff I've been building over the last year or so, and are really chuffed to have



made contact on all the bands I took (2/70/23/925/2400/3400/5760/10368) most of which are first contacts on the bands for me, or DX records.

Most of the time it felt like I was in a tag wrestling match against ZL1SWW (aka ZL1AA team), ZL1TPH, ZL1AVZ and ZL1BK as they didn't leave me with much time to get back to 2 m on Sunday to round up contacts. Next year I think I will attempt the Guinness record for plate spinning!

There were several highlights and surprises. Highlights included working Ted 2IP on 2 m, and he decided spur-of-the-moment to dust off the 23 cm gear for a contact. Using just his dish feed we managed to work each other fairly well. I said that I had other microwave bands so he dragged out all of his other bands using just the feeds and we worked 2G, 3G, 5.7G and 10G with him pointing a dish feed (or open waveguide on 10 GHz) out of his shack door. He later said that's the first time he has worked all bands on the same day in the span of 1 hr.

Surprised to work Simon ZL2FAE on 2 m and 70 cm through a lot of rock. He certainly has a good takeoff from Wellington and it lifted up well on Saturday evening. He was strong enough to be S5 off the back of the beam but dropped back on Sunday. Unfortunately nothing on 23 cm.

Also surprised to hear work Brian ZL1AVZ on 3.4 GHz after we wrote off the possibility earlier in the day, he just popped up like a submarine at the end of a scheduled contact with both ZL1TPH and ZL1AA.

Microwave conditions were definitely down, and I feel that the recent weather pattern is to blame. Driving up on Friday afternoon it was a hot clear day but I only started to see the mountain through the haze from Eltham. The haze was like seeing Mt Fuji and I feel that the debris in the atmosphere due to the one week of settled weather attenuated the microwave bands too much, but the debris size did not affect the lower bands.

Also worked Ray ZL2TAL on 3.4 GHz; he had a nice crisp signal on 3.4 GHz (better than his lower band signals, Hi!) which I got on video, so it was a good day for everybody to test out their gear. I think the only casualty was Harry's IF rig which developed a TX fault on Sunday.

I stopped by Ted 2IP's place on the way back and had the best cup of coffee in living memory."

Steve ZL1TPH reports also "I operated a separate station as ZL1TPH up the road from Simon ZL1SWW / ZL1AA at Cape Rodney on Sunday only. I had 925, 3400 and 5760 MHz only. Harry ZL1BK was hard over on 5760 MHz to Ruapehu at 340 km. Contacting Wayne ZL2BKC on 5760 MHz on the north face of Egmont was headphone (Q5) material at 340 km. The difference between Harry at 1500 m as compared to Wayne at 950 m ASL makes a BIG difference. In my opinion, the microwave bands were not open; they were as flat as a pancake. We had some fun, got rained on and in the mist, so was hard going."

The scribe reports. "Thanks to all those who participated in the DX weekend. We at ZL1AA (Mark ZL1BNO and Simon ZL1SWW with Steve ZL1TPH Sunday) had a great fun time although the weather was not good. We were located on a windy, misty and rainy ridge up at Cape Rodney approximately 400

continued on page 46

Monitoring Service

Monitoring Service Co-ordinator: John Martin ZL1GWE
<john.martin@nz1.ibm.com>

Monitoring Service

Greetings to all, including Short Wave Listeners and contributors. The last couple of months have been challenging to say the least; it is as though 2012 never ended. 10 metres has been inundated with wide band Over the Horizon Radar) OTHR with bad splattering existing over 500 kHz in bandwidth. Region 1 has reported to the appropriate authorities and determined the source to be Iran.

On occasions, the bands have appeared to be very quiet almost dead. Kiwi Dxers have complained they have not heard signals, which others have been hearing or on other occasions weak signals have been hidden due to interference or intruding signals. We often take it for granted, that signals will always be there, and that aerials are functioning and the equipment is working correctly. How many people actually question, whether their station is actually working correctly? For example: The noise level on 17 metres has risen, since the last time you reviewed the band. One immediately suspects atmospherics or intermodulation products from a known broadcast station, but could the source of the issue be more local? So what do you do? Try other bands; does the same noise level persist? Ask others? How about trying 160 metres or 80 metres or long wave? Switch aerials, if possible and see if the same noise persists? If you run your equipment on mains normally, try switching to the back-up system (batteries)? Does this make a change?

A more drastic approach, which I suggest you get permission from XYL or YL first; switch off the mains into the house. Has the noise disappeared? Perhaps a better approach will be to take a more systematic engineering approach? Is there a local source of noise occurring from within the shack or station? This is best checked by turning off items such as the Internet router, laptop, computer, monitor screen, one at a time. Do you see any change at all? Is it a bad joint, a badly connected connection? For example, you identify that the power supply to your station clock appears to be the culprit? Obviously, noise is being generated through the power supply and creating a wide band hash or multiple repeating signals across the HF spectrum. Turning off the clock, immediately it disappears and the weak signals you thought were not there, suddenly appear. The moral of the story is when dealing with radio signals; suspect everything, i.e. every power supply, computer, TV, water heater, telephone connection, coax, aerials and any other source of noise is suspected, until you have eliminated it. Keep a record of your findings, record it in your station log. Remember everything is guilty until proven innocent. Even if a piece of equipment has a compliance sticker i.e. RoHs or CE compliant – equipment, computer, USB Interface, aerials, feeder line does fail, over time. Things do change.

The same approach occurs, with intruders, always verify is it real signal or is it local interference? Is it genuine? Is it known? Now you are all paranoid. You are in the right modus operandi (mode of operation) for finding intruding signals. Get to know your radio station. Get to know the bands at different times of the day or night. Did anyone notice the lack of OTHR during the last HF competition? All the normal OTHR signals were residing outside of the amateur radio spectrum. Even the Australian JORN OTHR signals were being broadcast outside of the AR designated spectrum. Based on that observation, should we have more regular international competitions, occupy the HF bands and everyone would be happy and content. Keep using the entire spectrum, use it or lose it. If you have experience of locating noise sources, how about sharing your experiences, so that others can learn, detect them, and avoid them if possible?

Thank you for all contributors during the last couple of months. In particular, thank you Bert ZL1VT, for providing the ALE stations during February.

If you have a signal you cannot identify, please provide an audio sample, and we will attempt to recognise it for you. Please report intruders to: <MS@NZART.org.nz> or <MS2@NZART.org.nz.> or <IntruderWatch@GoogleGroups.com> or to your favourite DX Cluster. Please include if possible, the frequency, time in GMT or UTC, mode, strength and direction (if available). A real bonus would be an audio sample, long enough for identification purposes and any observations you have. If you have any questions, do not hesitate to contact me directly.

John (ZL1GWE)

Intruder System Observer League Table 2013 (up to end of February 2013

Contributor Name / Call-sign	Number of verified reports
Bob ZL1BAD	68
John ZL1GWE	54
Stephen ZL1TPH	16
Bert ZL1VT	3
Gary ZL2iFB	1
Tony ZL1TTG	1
Rex ZL4IV	1
Ken ZL4NR	1
Others	0

◂ *continued from page 45*

m ASL. Seems we had a reversal of weather patterns that normally haunt the central plateau area at the VHF contest time! It was windy all the time we were there and slowly deteriorated to misty rain. Everything got wet. I tipped up one of my transverters and water came out. Our 925 MHz contact to Wayne ZL2BKC was great and was my personal best at 337 km. Awesome!"

Contest results

Congratulations to the following participants. In the 2013 DX Weekend contest.

ZL1AA	RF73ir	10 678
ZL2BKC	RF70br	9851
ZL4AA	RE54fe	3694
ZL2FAE	RE78lx	1323
ZL2ADU	RF60wn	654
ZL2KG	RE79og	146

2013 VHF-UHF-SHF Contest Calendar

- ***Low Band Contest.*** All bands 50 MHz to 440 MHz. First Saturday in April, and the following day. Delayed one week if it clashes with VHF Convention, or Easter.
- ***Hibernation Contest.*** All bands 50 MHz and up. First Saturday in June, and the following day. Delayed one week if it clashes with NZART Conference.
- ***Brass Monkey Contest.*** All bands 50 MHz and up. First Saturday in August, and the following day.
- ***Microwave Contest.*** All bands 614 MHz and up. First Saturday in October, and the following day.
- ***Field Day Contest.*** All bands 50 MHz and up. First Saturday in December, and the following day.

For all contests, the operating periods are 1700 to 2300 on the Saturday, and 0700 to 1300 on the Sunday, NZ local time. The Contest Rules are available at: <www.vhf.org.nz/VHF-UHF-SHF-ContestRules>. All contest logs should be sent, to arrive within two weeks, to: <zl2wa@clear.net.nz>

Summary

Many thanks go to the contributors who help make this column happen with their input – ZL1TPH, ZL4HL and others. If you have input and pictures for the columns ahead; such as DX activity reports, repeater installation, branch activities, snippets of interest, technical items etc, please send to Simon ZL1SWW at <zl1sww@nzart.org.nz> or *Call Book* addresses. (I also accept large picture files sent via email).

Editor's note: *Because of pressure on space in this issue and other considerations an article on "EME on 1296 MHz" by Hugh ZK4LH will now be published in the May/June issue of Break-In.*

DX Downunder

Graeme Hunt ZL1ANH and ZL1T
<graemeh@xtra.co.nz>

Conditions over January and February were fairly average, but some interesting DX was there to be logged. Several Europeans escaped their winter to spend time on at tropical isle, so there was activity from A35, ZK3, FK8,E5 and 5W. DXpeditions to Burundi 9U4U, Uganda 5X8C and Burkina Faso XT2TT were worked by some ZLs. Clipperton Island should have made an appearance in March.

I decided it was high time I got my 5BDXCC; that's at least 100 countries on 80, 40, 20, 15 and 10 metres. Visit <http://www.arrl.org> to learn more about 5BDXCC. I was 30 short on 80 m, which is pretty slack after 50 years on the air. To correct this lamentable situation new 80 m antennas were considered but rejected due to lack of space; gain antennas at that frequency assume heroic proportions. While there a few ZLs with great 80 m DX set-ups like 4 squares, or at least 80 m verticals with adequate ground planes, many others seem to manage adequately with dipoles or similar. Maybe with an inverted Vee 15 m high and 1 kW I could work the elusive 30 DX. CW should be easier and this turned out to be the case although some SSB would be involved.

Our night-time is fine for 80 m around the Pacific, the Americas and East Asia but to work the rest of the world, it was time get out of bed early and meet Mr Grey Line. Grey line propagation is more relevant for the lower bands of 160/80 m and is the dawn/dusk period for both you and the DX. For example during January our dawn coincides with dusk in Western Europe. Each month this changes as days lengthen in the northern hemisphere, and shorten in the southern. During the grey line period, there is often good propagation along the dusk/dawn portion of the earth on lower frequencies – but not always. All the other factors like sunspot activity affect signals, just as they do on other bands. An example of grey line software is at <http://dx.qsl.net/propagation/greyline.html>, and there are many others on the web.

So out of bed at 5.30am and CQing on 80 m CW and scores of UA, UT, SM, GM and sundry other Europeans go in the log. Fortunately day one of my journey to 5BDXCC was brilliant, the next day nothing, just as well that wasn't day one, I'd never have tried again. At the time of writing I still need a few, and a couple of QSLs are still to arrive but thanks to Mr Grey Line it looks promising.

Some observations: As on other bands, conditions are different up and down ZL, you don't have to be a top CW op or have larger antennas but you do have to get out of bed early. Grey Line propagation isn't black and white, well it's grey of course, but sometimes there is good propagation in broad daylight or completely dark, just outside the grey-line. Up here in the Far North I found our dusk grey line not as good as our dawn one , but it's apparent that those further south are working the DX around sunset, which of course is later the further south you travel.

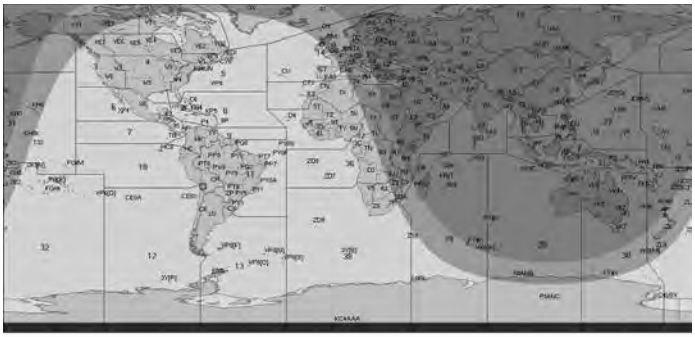
JT65-HF and Propagation

JT65-HF is a weak signal mode developed by Joe Taylor, K1JT and available for download at <http://sourceforge.net/projects/jt65-hf/>. Specific frequencies are used on each HF band. A contact is made with one station transmitting during even minutes, and the other during odd minutes. Data is limited to 13 characters in each minute. What it lacks in speed, it makes up for with its ability to communicate when signals are very weak, and in some cases inaudible to the human ear.

One the uses I have been putting it to, is to get JT65-HF to monitor a particular HF band for me. To check when propagation is best, I leave my radio running the mode on the JT65-HF frequency which is 3576 kHz USB when I'm not in the shack. On return there are all the times and calls heard;

EU EU EU EU EU EU. There was an FK8 calling CQ, and sometimes he added EU. Long silences so I sent my ZL. Replied with EUs, a torrent from hell. Pardon monsieur, but there wasn't a queue.

"Ode to Rêmi" was written after two weeks of trying to work him on 80 m and waiting patiently in case EU called.



Grey Line.

From around ZL

ZL3GQ Graham. Two nights before Christmas my neighbour's son came over and announced to my boys aged 8 and 10 that Santa Claus did not exist! Rightly my boys were somewhat disappointed and came to me and expressed their disappointment asking me straight out, does he exist or doesn't he? My answer was boys you have to make up your own minds. Both Leo and Isaak went off to consider this and I turned the TS 850S on. Whilst looking around for DX a spot appeared on the cluster, OH9SCL, official Santa Claus Station. What's all this? A QRZ.com search came up with OH8X Radio Arcala website and they were indeed QRV as 2 stations, OH9SCL (Santa Claus land) and OF9X (old father 9 Xray), none other than Marti Lane himself as Santa Claus. Well here was an interesting state of affairs, tasked with the job of finding Father Xmas, I e-mailed Marti Lane at Radio Arcala and we set up a sked.

Santa award.

It was Christmas day and the boys had been listening for OH9X

Leo, aged 10, working OH9SCL.

Isaak, aged 8, in QSO with Santa.

for 2 days without luck (they were practically beside themselves at the thought of actually a QSO with Santa) At sked time of 5 pm, we tuned again to 20 metres SSB and listened, nothing on short path, so we turned long path and there was Santa working a JA/EU pile up. We tried a few times with no luck. Now I have been on HF for a few years working DX but I can honestly say I have never known a more magic moment than what happened next. Marti (OF9X) tells the entire frequency to be quite, as he is turning the antennas to New Zealand and wants to talk to Leo and Isaak at ZL3GQ. I call him, we make contact and I pass the mike to first Leo and then Isaak, they both QSO him and are ecstatic! Not one murmur of QRM from the pile up the world stood by to let to let 2 little boys from ZL talk to Santa. My hats off to them all every one. What I love about all this is that it proved to me that Xmas magic is still alive and well all around the world. After hearing so often about the bad behaviour of hams in pile up situations it is a pleasure to report the good behaviour, if you were part of that hoard that stood by for my two budding ZL's, thank you.

So we finish the contact and the frequency erupts again with the EU/JA wall. Both Leo and Isaak received a certificate from OF9X confirming the QSO with Santa. All in all it was a fantastic Xmas present for the boys and me as well; I now have two very enthusiastic budding ZL hams. Watch out for them in future!

Graham ZL3GQ

From ZL3IX. The highlight of the month has to be working Jon OY9JD on 160 m (long path) for #205. Jon is only running 100 W at the moment, and has a high noise level at his town location, so propagation had to be rather special for that to happen.

In fact we have had a very good season so far on the long path to EU, and I have occasionally put 8 or 9 in the log, including an LA or two. Now that is a seriously long way for 160 m. It would be 23 000 km as the crow flies (if it could fly that far) but with the skewing towards the Caribbean that takes place on this path, I'm guessing the distance is more like 24 000 km. As usual the propagation has been very spotty, with a 150 km or so difference in location making all the difference. This season we have not seen any of the extreme skewing (as far as NE) that I have sometimes observed in previous years.

Short path to Eu hasn't been too bad in the mornings either, and some days I have put 13 or so in the log. The discipline of the eastern Eu ops doesn't improve though, and some of them still choose not to understand the meaning of KN, or even KNNN.

A bit of a milestone for me, was receiving my DXCC endorsement for 200 contacts on Topband, this last weekend. I posted 50 cards off around the 3rd week in November, so the turn around was nearly 3 months. I suppose that's not too bad with the festive season in the middle.

73, *Greg, ZL3IX*

Spotting and Leader Boards. Mike ZL2CC sent this after reading my February column "Hi Graeme, Just read your column and can't agree more with your comments on DXing. From my point of view, if I already have the country on one band I don't bother to try for another band until almost at the end when the QRM dies down. Like you I'm an avid DXer and contester but once I have worked and got confirmation of a country, why cause more QRM for others. Yes, the behaviour of the present day "DXers" (and in my opinion they are not real DXers) is getting worse. You may not agree, but in my opinion it's all since the dropping of the CW. It may be coincidence I guess? Yep! I disagree with both spotting the DX and leader boards. A sign of the times and I suspect it will get worse, drive away a lot of the so called 'new DXers" and then we will be back to a better environment again."

(I'm always happy to publish feedback; particularly if it agrees with my views ! ZL1ANH)

From Phil ZL3PAH. Conditions have worsened somewhat following the high SFI figures we enjoyed during December. 15 m has still produced some good DX at times but my activity has been lower during the past month, mainly because of Christmas/New Year when I was away.

The appearance of ZK3T with no advance warning produced a spate of 'Pirate' comments on the cluster. ZK3T has been used by Black Molly, the well known pirate from somewhere in our region, although no-one quite seems to know where. However the activation proved to be good and is DJ2EH. The first sign was the efficient handling of the pile-up on CW; this did not sound like Molly at all. Although I had worked ZK3 before I checked and it was only on 40 m so I have been busy trying to fill in some more bands and modes.

New Members

Name	*City/Town*	*Branch*	*Call-sign*
D G Allen	Palmerston North	20	ZL1VBN
P Duhs	Penrose Auckland	2	ZL1SLM
P J Corbett	Lyttleton	5	
A Sakumo	Papatoetoe	2	ZL1EA
P Kaines	Whangarei	28	ZL1MSU
A Mordecai	Auckland	65	ZL1GBG
T Laundy	Springlands Blenheim	22	ZL2TJL
D Wright	Whangarei	28	ZL1MVL
P Seakins	Dunedin	30	ZL1AHU
J O'Sullivan	Nelson	26	ZL2CO
Steven Barriball	New Plymouth	27	ZL2KJB
David Grey	Christchurch	5	ZL4EE
Helmut Steltner	Whitianga	78	ZL3JO
Luke Claydon	Kaikohe	78	ZL1LLC
Stephen Andrews	Silverdale Auckland	29	ZL1XK
UK OTC	Mansfield Rd Tweedmouth UK	98	
L McFadden	Christchurch	56	ZL3LOZ

Silent Key

Chances are you will have worked John W7KH who passed away recently at 91. John, licenced since 1938, sat at the top of the DXCC mixed standings with an incredible 398 entities.

DXpeditions

Angola D2FJZ, for 2013

Antarctica VK0JJJ, Craig from Mawson Base until January 2014.Active on SSB, digi 160 to 6 metres.

Burundi 9U, look for HA3JB, now living there. 20 m SSB and PSK31.

Djibouti J28NC, for the next two years.

Gabon TR Sebastien, F4EIH, will be in Gabon for at least three years.

Gough Island ZD9KX. for one year. ZD9KN heard on the bands recently was a pirate.

Heard Island VK0HI. proposed for 2014.

Jersey MJ, between May 24-30.

Juan Fernandez CE0Z. Robinson Crusoe Island mid 2013

Luxemburg LX/OO6P. between June 30 and July 5.

Miquelon Is FP/KV1J. from July 6 to 16.

St Pierre & Miquelon FP/KV1J. between July 6 and 16.

Tanzania 5H3MB. April 7 to May 8.

Tokelau ZK3N prefix may change, April – May.

Tunisia TS8TI. April 29 to May 6.

Nets

ANZA Daily: DX net at 0515z on 14 183 kHz and now also Saturdays 0445z on 21 205 kHz. Mondays, Fridays and Saturdays it is followed by the Pacific DX net on the same frequency from 0600z.

Arabian Net: Fridays only 0500z 14 250 kHz - host JY5HX and features exotic Middle East calls.

ZL DXers: KiwiDX Summer SSB Net ZL1KDX ±7.133 MHz Tuesdays 0700z, DX Cafe format, bring your own coffee!

What's on the air now? <www.dxsummit.fi/DXSpots.aspx.>

QSL information: <www.qrz.com.>

Acknowledgements: 425 DX News, OPDX *Bulletin*, NC1L. ClubLog. Contact me at *Call Book* address, or by email at <graemeh@xtra.co.nz.>.

WARO – nz womens amateur radio operators

with Topsy ZL2LS and Ngaire ZL2UJT
<waro@nzart.org.nz>

Hi from the South Island. The holiday period has come to an end and Nelson is getting back to somewhat normal again. Summer was slow in arriving this year but we are having some amazing weather now, but still need a bit of rain. We have been away in our motor home a few times over the last couple of months, but not as many as I would have liked, due to David working some weekends. I have been busy at work getting new surgeons on board and theatre schedules filling up quickly which is always good. David has been in for surgery recently so have been being nurse both at home and at work. He is now on the mend which is great. I have had another birthday since the last *Break-In*, but hey I don't feel any older. Radio wise haven't done much but hope to take part in the Jock White Field Day Contest and also busy planning AREC event coming up in March which is comms for Cycle Race through some of New Zealand's back country roads, ending in Hanmer Springs.

That's about all from me for this time, take care and have fun in your amateur radio hobby. Cheers Topsy ZL2LS.

Hi from the North Island, Here in Taranaki we have had the best summer in years. We've had grandkids staying over the school holidays and have spent hours down at the beach in the river swimming and having picnics in our motorhome. Our daughter and her partner came up from Kumara on the West Coast for a few days holiday with Mum and Dad which was great as we managed to get 3 of our 4 children together for a photo after many years. It was great to have them here to support their Dad who is due to have heart surgery on 19th March, second time in 7 months.

Radio wise I seem to have been tied up with visitors on WARO nett nights, but have managed local VHF netts which I enjoy.

Sadly this year have lost 3 first cousins and 3 friends in 8 weeks, one being Roy Symon ex-President of NZART who has been a good friend of ours for many years. He was always prepared to help out in our local club and very supportive of WARO members. Ngaire ZL2UJT

Notice of Annual General Meeting

The Annual General Meeting of WARO will be held at 08.30am on Sunday 2nd June 2013 at the conference venue at Solway Park Conference Centre Masterton. The agenda has been published in the latest bulletin. We hope as many members as possible can attend this meeting. All YLs and XYLs are welcome to attend. XYLs can become associate members of WARO if they wish.

Conference Solway Park Masterton

We are looking forward to meeting up with you all face to face again, not only with WARO members and their XYLs but other amateur radio operators who are attending Conference in Masterton. From what I hear it is going to be a great conference, so let's get in and support the team that has hosted this conference for us all. See you all there.

Nominations for Executive

Nomination forms should have been received by now, but if there is any unfilled positions nominations can be accepted at the AGM. New members are welcome on the Executive, so don't be afraid as no one position is onerous and does not take a large amount of time. Please consider if you could make yourself available for any vacant position.

Vacancies that are to be filled this year are President and Secretary. Cathy Purdie ZL2ADK has offered to fill the position of President this year after Margaret ZL1MB is standing down after three years. ZL1LL is standing down from the position of Secretary after three years so this position has to be filled hopefully at the AGM. If you think you would like to take on this position please do so and would be great to have you aboard

The Executive meets on air every two months making that five times a year and at the Annual General meeting during the NZART Conference at Queen's Birthday weekend, so not a lot of work involved there.

Thelma Souper Contest

The date for the Thelma Souper Contest this year is 27-28 April, and we hope that a good number YLs come up this year. We have had a gap of one year due to lack of support so let's all get in and support these contests, and support the Contest Manager in all the good work they do to get these contests up and running, and also to support the OMs that come up to support WARO. All contacts are to be made on 80 metres.

Full details of the contest are in the January/February *Break-In.*

Please get your logs in no later than 15 May to Bev Osborne ZL1OS, 34 Cobham Drive, Kawerau 3127 New Zealand. Logs can be also be sent via email to <zl1os@slingshot.co.nz>. No logs will be returned and no correspondence will be entered into.

The highest scoring WARO member will be awarded the Thelma Souper Memorial Cup to be held for one year. The highest scoring OM operator will be awarded a trophy to be held for one year. Certificates will be awarded to the first three WARO Members, the first three OMs operators with the highest scoring VK/YL operator.

WARO Awards

Contacts with ten different WARO Members during the Thelma Souper contest are sufficient to apply for the WARO HF Award. Please send a list of the ten contacts to:

The Awards Manager Lynnette McDonald ZL1LL, 25 John Street, Pukekohe 2120. There is also a WARO/VHF/UHF award which requires ten contacts with WARO members.

NZ WARO Achievement Award

This Award takes the form of the MYRTLE EARLAND MEMORIAL ROSEBOWL which shall be retained by the winner for the succeeding year, together with a suitably engraved shield to be kept by the winner. The winner, if any, to be announced by the NZ WARO president at the NZ WARO Annual General Meeting. Unsuccessful nominees may receive a certificate of achievement if appropriate.

Criteria

The nominee is to be a member of NZ WARO who has made a significant contribution in any aspect of Amateur Radio, e.g. Personal Achievement as a NZ WARO member, Services to NZ WARO, Services to NZART at either Branch or national level, Community Service including Civil Defence and Search and Rescue, DX participation, Contest, etc. The Trophy may not necessarily be awarded every year, and when not awarded shall be kept either in the NZ WARO cabinet at NZART Headquarters or at the home of the Award Custodian.

Nomination Format –

Nominations to include a summary of the nominee's activities, which need not be restricted to the immediate preceding year, and are to be received by the Award Custodian on or before 30th April each year for consideration by the Executive. Unsuccessful nominations may be re-submitted in the following years, however, previous winners are not eligible for further nomination for the same or similar achievements.

Nominations for the NZ WARO Achievement Award may be sent by a member at any time if she considers a particular YL meets the criteria as set out above.

Previous winners of this prestigious Award are:

Vicki Shaw ZL1OC, Gael Pye ZL2SZ, Pearl Neilson ZL2QY, Cathy Purdie ZL2ADK, Dawn Young ZL2AGX, Celia Reed ZL1ALK, Carol Gaudin ZL2VQ, Biny Owen ZL2AZY, Jeanne Gilchrist ZL4JG, Bev Osborne ZL1OS, Jill O'Donnell ZL2DBO and Rosemary ZL1RO, Lynnette ZL1LL and Bev ZL3OV.

Rhododendron Festival Contest

Branch 27 has run this award for many years and last year due to ill health within the committee it was decided to have a year's break.

We have been discussing the Award and have decided because of the garden Festival sponsors continually changing the name, we would create a completely new Award. After consideration the Club has decided on a completely new award called Taranaki Award which will be run from the 10 August till 18

continued on page 50

Break-In 50 Years Ago

Craig Crawford ZL3TLB

***Break-In* 50 Years Ago**
April 1963 Cook Islands Activity
by ZL3VW, ZK1AK

Amateur radio in the Cook Islands has been a somewhat haphazard affair, where spurts of activity have been marked by succeeding lengthy periods of inactivity. Reliable operation has been chiefly centred at Rarotonga where Bill Scarborough ZK1BS has maintained activity at a reliable level and engaged in radio-teletype and VHF in conjunction with work on all bands (CW, AM and SSB). As Rarotonga is the seat of Government in the Cook Group it is only natural that the concentration of Europeans would, by the law of averages, produce a number of hams and for this reason the greatest activity has been located there. Aitutaki, the next area of importance, has seen activity of a restricted nature as the ham interest has been primarily a means of infilling idle hours. As such, no QSL cards have been sent out, consequently overseas stations have claimed to have worked as many as four stations and have received no QSL.

Recently the Cook Island have been split into two areas for DX purposes, the Northern Cooks and the Southern Cooks. In the Northern Cooks there are very few Europeans. One drawback to operation in this area is the lack of source of power and activity would depend on visiting DXpeditions. In the Southern Group both Rarotonga and Aitutaki have power. At the former location power is reticulated to any customer prepared to pay for the service. At Aitutaki the airport maintains a supply for its own use from 20 kVA diesel-electric units. At Arutanga Village the Resident Agent and Messrs AB McDonald operate individual units for domestic and business purposes. The Mormon Church at Araura maintains a small 3 kVA unit for domestic lighting. As will be seen, the prerequisite to sustained activity – a good power supply – is not available.

At Rarotonga a very active club has been formed by Stuart Kingan ZK1AA. With the assistance of ZK1BS a number of native islanders are now on the air and holders of the amateur certificate.

Towards the end of 1957 I found myself posted to Aitutaki. In the intervening fortnight before packing I rushed together a rig for CW operation and tested it with an indoor aerial. It was then packed to withstand hard handling en route. During December 1957 I commenced operation on the 14 mc band with 180 watts input to a self resonant Zepp. The rig overnight achieved international fame. There was however a cautious approach on the QSL angle. So many Aitutaki stations had been worked and with no QSL and this was maybe another. However, when my QSL manger W3GJY publicised via QST the ZK1AK would QSL 100 percent the cards start to roll. The pileups increased in crescendo until it was almost impossible to copy any one station due to QRM.

G5BZ told me that the racket in Europe was equally as bad as the Pacific and on one occasion he logged 15 countries calling simultaneously. The American stations obliterated all opposition and I was compelled to adopt a system of calling stations individually and ignoring all others. By this means I commenced to accumulate countries toward the century Club certificate. However, the distinctive S9 signal aroused the competitive nature of overseas hams and in short time I was faced with all manner of artifices to obtain a QSO. Some fellows even wrote me abusive letters demanding a contact.

ZK1AK was active for three and a half years almost daily. As it was possible to QSO W stations 24 hours daily a considerable number of these were worked during daylight on weekends. Fifteen metres was tried but through lack of interest in this band and the fact that most stations were on the American continent it was soon abandoned for 14 mc.

It was noteworthy that the majority of stations were not interested in any rig statistics. They were however very attentive to descriptions of fishing expeditions, detailed descriptions of umukais and incidents peculiar to native and island life. By means of these rag chews I soon realised that I possessed a good vehicle for disseminating island customs, news, etc. I am sure that the medium of ham radio could be turned to good advantage by publicising local lore. Start on a good theme and I guarantee that before the QSO is ended a half-a-dozen stations listening around will fasten on to the frequency and absorb your comments. It has been claimed with some truth that two-thirds of the fraternity listen around the other one-third constituting the vociferous section whence stems all activity.

It was with regret that ZK1AK was dismantled in August 1962. By that time 156 confirmed countries had been worked on 14 mc and a number of awards accumulated. Activity however continues. ZK1AR with an extensive antenna farm is rapidly accumulating awards and maintaining Aitutaki in the vanguard of rare countries. Activity on the lower bands is restricted somewhat by QRN and on Rarotonga once the club members attain HF permits activity will inevitably migrate to higher frequencies.

◂ *continued from page 49*

August. I will put all the rules and points scoring in the next WARO *Break-In*. It will run for a full week as The Rhododendron Award use to so should be great fun. I always enjoy this as it really brings all the locals out of the woodwork and I know our regulars from out of town will love it. We will have a certificate with a photo of the mountain on it, so should be lovely. Watch this space.

WARO get together at Pirongia

On Sunday 27 January eleven WARO members and nine OMs gathered at the home of Biny ZL2AZY and Merv ZL2AVY at Pirongia. Their granddaughter Elizabeth assisted with the hostessing. Four members of Te Awamutu Radio Club attended also including Ruth (XYL of Garth ZL1WR). It was a very hot day for travelling and most travelled some distance to attend but Biny's home was cool and it was lovely under the big silk tree in the garden. Biny keeps her garden in immaculate condition. As people arrived they had a hot or cold drink and cheese straws straight from the oven! A shared lunch followed and the talk continued! Later on Alison produced her quilt of New Zealand birds. She has put hours of work into this and it is absolutely beautiful. Even the back is a work of art! As usual the OMs all lined up with their cameras. The majority stayed for another drink and more talk before heading off home, most making it home before the YL net was called by Joline ZL1UJB on 14.690 at 7 pm.

"WARO Get together at Biny's".
Back row: Biny ZL2AZY, Aola ZL1ALE, Margaret ZL1MB, Lynnette ZL1LL, Durlene ZL1ULK, Alison ZL1TXQ, Marlene ZL1MYL, Maxine ZL1FW.
Front row: Carol ZL1AJL, Celia ZL1ALK, Joline ZL1UJB.

Thank you Biny and Merv. We appreciate your generosity.

Lynnette ZL1LL

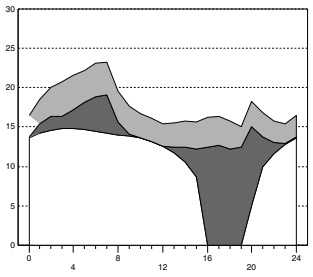
Please remember to support your *Bulletin*, WARO Page in *Break-In* and our competitions.

See you all at the NZART Conference. Cheers, take care and continue to enjoy the great hobby of Radio.

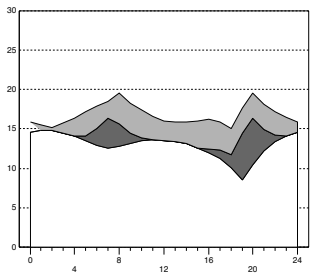
Topsy Zl2LS and Ngaire ZL2UJT

Ionospheric Predictions

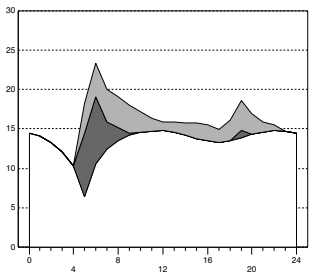
MAY / JUNE 2013 **T-index = 66**



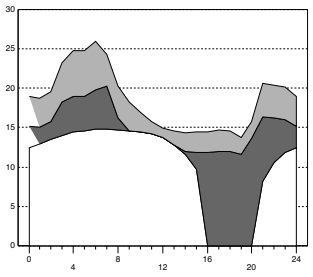
WN-
Moscow
(SP)
16548 km
312°



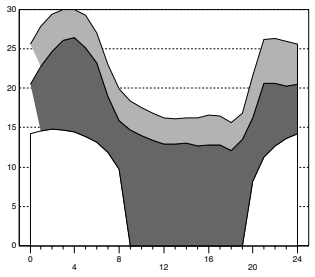
WN-
London
(SP)
18814 km
343°



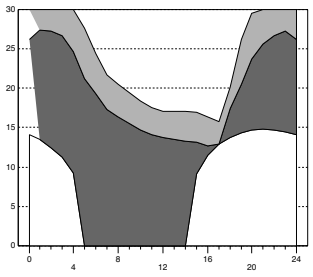
WN-
Jo'burg
(LP)
28265 km
31°



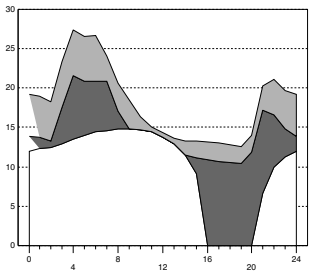
WN-
Istanbul
(SP)
17168 km
281°



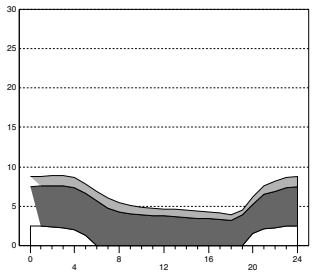
WN-
Tokyo
9274 km
332°



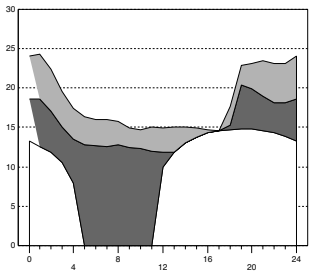
WN-
San
Francisco
10859 km
45°



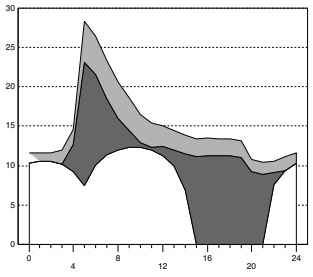
WN-
Cairo
16519 km
261°



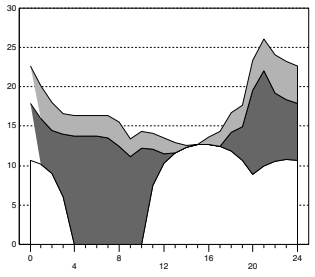
WN-
New
Zealand
300 km



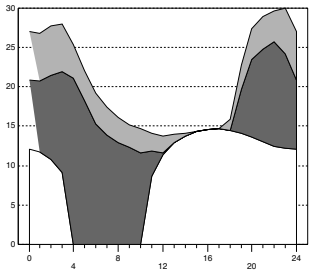
WN-
New
York
14402 km
66°



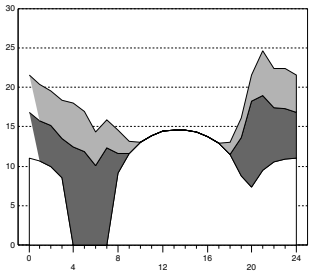
WN-
Jo'burg
(SP)
11759 km
211°



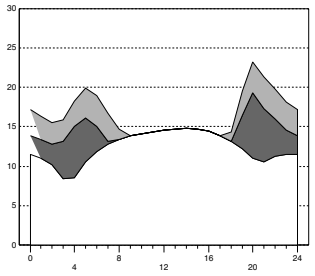
WN-
Rio de
Janeiro
11780 km
144°



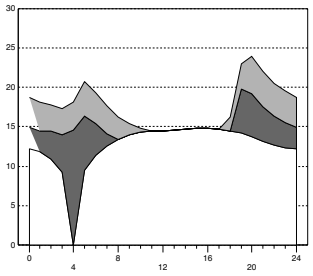
WN-
Barbados
13962 km
104°



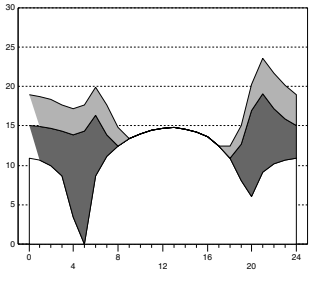
WN-
Dakar
16862 km
155°



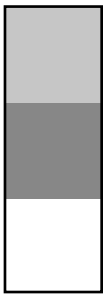
WN-
Moscow
(LP)
23476 km
132°



WN-
Istanbul
(LP)
22856 km
101°



WN-
London
(LP)
21210 km
163°



Horizontal axis shows time in UTC.

Vertical axis shows frequency.

Propagation is possible in the shaded areas, with best operation in the darker area.

These predictions are based on solar activity data supplied by IPS Radio and Space Services.

See pages 6–9, *Break-In* May/June 2004 "Choosing the Best Frequency" by the late John Gabites ZL2AQ for interpretation of forecasts and explanation of terms MUF, OWF and ALF.

HAMADS

WANTED: RADIO VALVES. Cash paid for old radio and TV valves. Prefer new in boxes. Telephone (09) 528-2022 or E-mail <paul.ssegrub01@gmail.com>

WANTED: *Break-Ins* – All 2009, all 2010 except Nov/Dec, all 2011. *Call Books* optional. QTHR, E-mail <zl2hy@clear.net.nz>

WANTED: Icom IC-W2E. OK if not working. ZL1TAY. Telephone (09) 413-8382.

WANTED: Valves wanted to purchase, fair price paid, all types but esp following types ECC32 ECC33 ECC34 ECC35 B65 6SN7 6SL7 ECC81 ECC82 ECC83 ECC803S ECC88 E88CC E188CC 7308 EF86 KT61 KT66 KT88 EL34 EL37 PX4 PX25 GZ32 GZ33 GZ34 GZ37 CV378 CV575 VT52 45 50 211 801 805 845. Also looking for an AVO or Weston Valve Tester and a good quality capacitor tester. Geoff Edwards, Valve Radio Spares, 12 Oxford St., Lyttelton 8082. Telephone (03) 328-9208 or (027) 433-8452 or Fax (03) 328-9207 or E-mail <tubehead@xtra.co.nz>

WANTED: Valve TB3/750 or equivalent for linear amp. ZL2TAG. Telephone (09) 620-5692 or E-mail <zl2tag@nzart.org.nz> or *Call Book* Address.

WANTED: TL922 Amplifier, AT120, Alliance HD-73 Rotator, Rotator Model DAR-200, KW Transmatch/SWR Transmatch. Kevin ZL3DAC. Telephone (03) 789-9875.

RAMSEY FM products now stocked in NZ! Professional PX50, low-power FM35BWT, FM100BWT, FMA200E antennas pre-tested direct to any Pacific location. Check www.ramseypacific.tv full description of each. Additional website help added monthly, web site in process. Ask at <skyking@clear.net.nz> or call (64 9) 406 1282.

Radio Electronics Group Inc

ANNUAL EQUIPMENT SALE

Branch – 89

GLENVIEW CLUB INC.
211 Peacocks Road
Glenview, Hamilton

SATURDAY 11TH MAY 2013

Vendors: 8-30am

Doors open 10am

$2 Lucky Ticket Entry

Trade display – Refreshments – Door prizes

Plenty of parking

Easy access

Motor Home Parking

For Vendor registration and enquires

Contact Trevor ZL4GJ (07) 8437 365
<trev99@xtra.co.nz>
<zl4gj@nzart.org.nz>

or

Radio Electronics Group
<reg.zl1reg@gmail.com>

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Marlborough Sounds

Superbly equipped for Amateur Radio Enthusiast

Two story home with third floor Belvedere devoted to amateur radio. House area 226 m^2 (2,400 sq ft). Three BR upstairs, 2 BR downstairs, two bathrooms, kitchen with large pantry, spacious living room, office, enclosed elevator from ground floor, car port and double garage with darkroom, potting shed, large vegetable garden. Panoramic bush and sea view, 15 minutes drive from Picton. Land area 0.0895 ha (0.22 acre), Rateable (Capital) Value $600,000. Telescopic tilt-over antenna tower 16 m high with rotatable OBW10-5 Optibeam, 2 m yagi and 2 m whip. Satellite tracking antennas 10 m high with 3D rotatable cross yagi upstream and helix downstream. Inverted V dipole for 80 and 40 m. The main radios are Yaesu FT1000 MkV (with Quadra VL1000 1kW linear and VP1000 Power Supply) and Kenwood TS2000A. The house is offered with tower and all radios and cabling to antennas intact. If there is no interest amongst Hams all equipment and the tower will be removed and placed on the open market. Anyone who would like further information please contact <ZL2JKP@nzart.org.nz>

Hamads and Classified Advertising in *Break-In*

Hamads up to 30 words are now free as a service to members but the following conditions will apply:

(1) Hamads. A single, free Hamad in each issue of *Break-In* is only available to financial members and Branches of NZART buying or selling personal equipment. Members and Branches wishing to use this service must include their NZART Membership Number or other evidence of membership. If possible they should use the official HAMAD form (on the reverse of their address sheet). If this is not convenient the advert may be emailed or sent typed double-spaced, but proof of current membership must be provided.

Each free Hamad is limited to 30 words; any extra words will be charged at the current rate of 25c per word, telephone and fax numbers count as two words each, e-mail addresses and *Call Book* address as three words each. All prices include GST. Free Hamads will also be accepted for sales of deceased estates where the member was a financial member of NZART during the past 12 months and from branches who are financial members of NZART (ie have a Membership No).

Advertisements are accepted in good faith from amateurs and may only be used be the sale of used radio and allied equipment. The Association, or its representatives, can take no responsibility for them nor take part in any discussion resulting from sales or purchases; remember "Caveat emptor". In case of dispute, the Editor's decision is final.

Trade or business adverts, even from members, will not be accepted here, since this is a subsidised service to members.

(2) Classified Advertisements are available to members, non-members and commercial firms offering products or services for sale, etc. All adverts not meeting the Hamad criteria will be considered to be Classified Advertisements.

Classified Advertisements will be charged at 40c per word. Bold type is available at 50c per word. For semi-display (ie rule above and below) add $5.00. All Classified Advertisements must be pre-paid, receipts will not be given. All prices include GST.

(3) Display style adverts will be still be charged for at the current rates.

(4) Closing date. Please send Hamads and Classified Advertisements to The Advertising Manager, PO Box 1733, Christchurch, to be received no later than the 10th of the month prior to publication. Please make cheques payable to NZART; no cash or credit cards. The Editor and NZART Inc reserve the right to discontinue or decline any advertisement.

For further information and commercial advertising rates, please contact:
Lorne Douglas ZL2AHB, Advertising Manager, c/- PO Box 1733, Christchurch. Telephone (03) 358-9100. E-mail: <hamads@nzart.org.nz>.

Situation Vacant

Following the resignation of the present *Call Book* editor and Advertising Manager would anyone interested in taking over these important tasks, or for further information, please contact either;-

Lorne Douglas ZL2AHB, phone 03 358 9100,
email <zl2ahb@nzart.org.nz>

or

John Walker ZL3IB, phone 03 3489 084,
email <john.zl3ib@ihug.co.nz>

An honorarium is payable for these positions.

John R L Walker. ZL3IB Editor.

WANGANUI AMATEUR RADIO JUNK SALE

Returning by popular demand !!!!

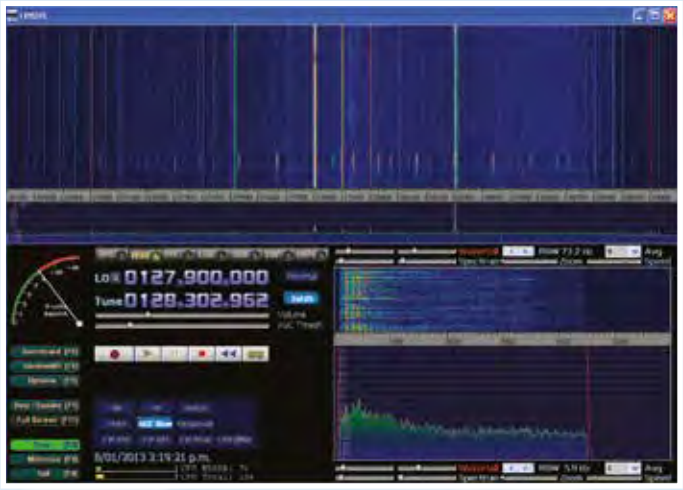
Branch 48 is pleased to announce the return of our annual Junk Sale!

Saturday May 4, 2013. Auction starts at 10am.
Wanganui Intermediate School Hall. Dublin St, Wanganui.
(same venue as last time)
Lots accepted from 4pm on Friday 3 & 7:30am to 9:30am.
Morning of the sale

SALE CONDITIONS:
Sellers pay 15% commission with a minimum of $1 and maximum of $20 on any one item.
Accounts will be run. (to be settled on sale day before goods uplifted)
Bids will be possible only by registered bidder number.
Bidders must register with a $5 fee. This will also provide them with a sale catalogue.
Cash, Cheque or EFTPOS accepted.

Clean out your shack and help us kick-off this iconic sale again!
Come and enjoy the social side of this old fashioned junk sale auction and help us make this an annual event again!

For further information contact Graham Hawtree ZL2AHR
Telephone (06) 344-7501 or E-mail <grahamandval1@xtra.co.nz>
Licensed Auctioneer



DRM from Russia using the RTL-SDR.

Grant ZL2BK's mobile set-up at Rally stage 3.

The Studio 1 receiver pane.

Kelvin ZL3KB gives a demonstration of tuned circuits.

Setting up 6925/ZL2AJ-1 repeater.

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- HF, 6m, 2m & 70cm Multi-band, All Mode
- D-STAR DV Mode Operation
- Built-in SD Card Slot for Voice & Log Storage
- IF DSP Controlled Digital Features
- Optional Mounting Base, MBF-1

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* IC-7100 Europe Version

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